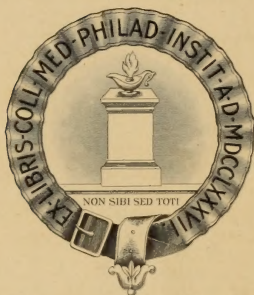


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EDITORIAL.

MEDICINE AS A PREPARATION FOR OTHER CAREERS.

So many great men have attained distinction in callings for which they received no youthful training that it is beginning to dawn upon educators that there is no way of determining beforehand in what direction a boy's talents are destined to develop. One-sided greatness, to be sure, generally shows itself very early. These cases, however, are mostly artistic geniuses or near-geniuses whose abilities are dependent upon an exceptionally constituted brain, which of necessity shows its character very early. Idiocy is recognized a few months after birth, always in a few years, and similarly the brain with extraordinary development shows its peculiar functions as soon as the nervous tissue grows. Consequently, great artists almost invariably are more or less precocious. These exceptional cases are given so much publicity that it is generally believed that every brain shows its calibre in childhood, and every mother derives exquisite pleasure in day dreams of her baby's future greatness,—dreams based upon actions common to all children. It is not generally known that the higher mental faculties, which we may group under the general term "judgment," are of slow growth. This is in accordance with the biological law that the tissues last evolved in our progress from lower forms are the last to develop in our progress from youth to maturity. The slowness of the growth is rarely appreciated, in fact many a man does not show his powers until long after his thirtieth year, and a few do not attain the full strength of those late abilities until after forty.

Pedagogs seem to agree that the education of a boy who is soon to be thrown on his own resources, should be of an extremely practical nature; and, all over the world, trade schools are replacing the old-fashioned apprenticeship, so that the student can make a living as soon as he graduates. This plan is an economic necessity and its advocates acknowledge that boys will frequently, if not always, select a trade for which they have no talent, and ignore the one for which they may subse-

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quently develop superior ability. A certain amount of displacement is then unavoidable; and as it may be too late to learn a new trade when the abilities develop, a percentage of men must pass through life without a chance to do their best.

In respect to the higher education, which of necessity can be given to only a small percentage of men, there is also a beginning agreement that it should be of a generalized nature, as a mere preparation for the technical training which comes considerably after twenty-one years of age. Since few men can be supported in a prolonged unproductive period, there has long been a tendency to permit early specialization; but this elective system has been carried to such an extreme that there is a vigorous reaction, on the ground that the general education is so neglected that the boy becomes a narrow specialist, who is inefficient by reason of his ignorance of allied branches and their relationships. Indeed, certain railroads, despairing of obtaining properly trained officials, have long been training their own young men in a species of higher grade apprenticeship. The raw material which they use is the generally-educated college graduate. The technical schools are also realizing that specialization begins after graduation, and that a species of apprenticeship is a permanent necessity if the young man is to support himself while being trained for his life work.

Even in medical education the same plan has been suggested. In the near future we need not be surprised if each practicing physician will have one or more recent graduates as assistants, who will return for post-graduate special training as soon as their capabilities show themselves. Of course there will be more limited training for those who settle upon a narrow sphere of activity, somewhat of the nature of the dental courses and the proposed sanitary schools.

It is quite evident, then, why so many law and medical graduates do not practice their calling in later years,—they were misplaced. On the other hand, the distinction they have attained in new lines has raised the suspicion that their training really was of vital importance and gave them new views which were impossible to the narrowly trained. Perhaps success was due to the fact that they could see things in a new light, as in the cases of Huxley, Darwin, Francis Galton, Livingston and Mungo Park.

In Europe, law-making was formerly in the hands of those trained in statecraft, the rôle of the lawyer and judge being merely to learn and to apply the law. To a certain extent lawyers are still excluded from the making of the law; but in America the study itself is being more and more looked upon as a preliminary for statesmanship. We have no colleges, like those of Oxford, whose purpose was really the training of

ruling classes for the public service. Nevertheless, so many other men are eminently successful in statecraft, that it is already suspected that other training may be even more valuable than that based on Blackstone, and there is a movement towards the European system. Men with a broad general education, in which economics forms an important part, are being urged to enter public service, instead of narrowly trained lawyers.

Similarly the rôle of the medical college is being slowly changed. It took the place of the old apprenticeship and was designed to train practitioners; but the graduates are finding that the medical course fits them for other callings, scientific, political or business, in which medical knowledge is of extreme importance. We find physicians among the great explorers, the great statesmen, the great military leaders and the great business men. There is little doubt that their study of mankind has been a large factor in training abilities essentially non-medical. In Europe it is amazing what a number of physicians take an active part in public affairs, while in America it was formerly an article of medical faith for the doctor to keep out of politics. These facts should be taken to heart, for we must realize that many a student is utterly unfit to practice and will only find it out when too late. Besides, it is impossible for all graduates to make a living in an overcrowded profession, and some must seek other livelihood. Would it not be well to look upon a medical course as merely a foundation for post-graduate specialization, as a general practitioner, specialist, scientist or even a non-medical career? That is to say, the late-appearing mental qualities must be considered and students warned that it is not essential for them to continue in medicine to be successful and valuable members of society, if they subsequently develop greater ability in other lines. The graduate is not necessarily to be a practitioner, any more than a clerk is to become a merchant.

All colleges are now and then unjustly criticized because great men so frequently arise from the uneducated mass, though it should have been known that the very few who get a university training are not possessed of all the brains in the world. In like manner, the medical schools come in for some attacks because they did not happen to have trained Pasteur and others who have added so much to the world's knowledge of medicine. In other words, we must expect that non-medical schools contain misplaced students who are destined to be of great value to us. It does not behoove us to reject the discoveries of extra-academical workers, nor should the geographers look askance at the work of such medical travellers as Livingston. In fact, there is a something connected with a good general medical education which pe-

cularly fits a man for every kind of work which can be classified with anthropology—the humanities,—even exploration and sociology. Statesmanship is merely a branch of anthropology after all, and it is no wonder that so many eminent statesmen are trained physicians.

In other words, medicine is the best possible preparation for serving society. The time is already here when men of means must take up public service as a duty, instead of frittering away their lives on "society," "sport" and frivolous things. The poor man can hardly find time to earn his own salt, let alone the duty of helping others. Why not then advise the rich to study medicine, not to practice it and take bread out of the mouths of professionals, but to fit them to careers in statecraft wherein their medical knowledge will be invaluable in devising laws increasing the efficiency and longevity of the workers? Congress should be at least one-eight physicians, but it will never be such as long as medicine is looked upon as a means for poor men to make a living. Let the college doors be opened to embryo statesmen of wealth, who can afford to spend time working for humanity. Medicine is sure to become a necessary foundation for public service in many of its larger branches. Populations are now so dense that a knowledge of sanitation is essential for all law-makers, and nothing will suffice except the election or appointment of sanitarians to positions of authority. So let the medical schools take heed of their duty to society, in addition to their past attitude of duty to the individual sick. Let them turn out statesmen skilled in prevention, in lieu of experts in cure. We are an essential part of civilized society and we must train the servants. The medical school which tries to train only practitioners and not preventers, is more of a curse than a blessing.

THE IDEAL CLIMATE.

A noticeable characteristic of Americans is a curious dissatisfaction with the climate, which is blamed for about everything in the way of bad health. With the exception of the weather, there does not seem to be any topic so prolific of small talk as the disagreeable features of the local climate. It really seems as though everyone is changing his residence periodically or permanently to escape that climate, or bemoans a fate which prevents his escape. Even the places possessing some one characteristic supposed to be good, and which are extensively advertised as cure-alls, playing upon the wide-spread dissatisfaction elsewhere, are

found to have other features compelling the residents to run away now and then for relief. There can also be too much of a good thing.

Recent anthropological investigations have revealed a good cause for the national rebellion against our own climate. A few bold men like Prof. Wm. Ridgeway, of Cambridge University, are claiming that it is high time we include man in the scheme of nature and give up the delusion that we are superior to natural laws. In a thoughtful paper read before the British Association and published in the *Popular Science Monthly*, he has shown that the law of adaptation to environment known to be universally true as to lower animals, also includes man. That is, nature, by her usual brutal way of killing off the least fit and preserving the fittest, has produced types of men, more or less perfectly adapted to the climates in which they have proved fitness by surviving. The various races of mankind differ because their climates differ. The present task is to find out why one environment produces white men and another black, why the tall survive here and the short there, and so on through all the other differences. The zoologists and botanists are busy on the same problem and have ceased the foolish habit of declaring a character useless when they fail to find the use.

The reverse proposition is the one which interests the medical profession. It is now acknowledged that a species transferred to a new environment is not possessed of proper defensive or offensive characters, and must change its type by survival of the fittest variations, but if such do not appear, then gradual extinction is the result. It is beginning to be realized that the original migrations of man were very slow affairs, permitting of gradual change in type and survival in the forms now found, but that a rapid migration is followed by extinction. When adjustment is proved by survival, we do not find dissatisfaction with the climate. The European peasant never gives the matter a thought. The swarthy Italian is perfectly satisfied with his sunny skies and the blond Norwegian with his mists and clouds, but the former would suffer from the cold of Scandinavia and the latter from the heat and light of Sicily. Neither has the least desire to escape any feature of his native climate, but let them come to America to better their fortunes, then each is sure to find some disagreeable feature wherever he settles and he joins the great army of the dissatisfied. Perhaps he may move on in the never-ceasing quest for the ideal which he left behind in Europe. For these reasons we find a remarkable and instinctive tendency of each type to gravitate towards the place which most closely resembles the native climate. Our Mediterranean immigrants are filling up the south, and Scandinavians naturally stay north, while negroes flourish where it most resembles Africa.

The new knowledge which has come with such a shock to the medical profession, is the fact that in each of our climates certain types do have

a greater morbidity and mortality. Life insurance statistics, for instance, show that the big men so healthy in northern Europe suffer more than the underweights from cardiac and nephritic diseases and do not live as long. It now behooves the medical profession to make similar observations in each climate, for by such means we will in time find out why the races of mankind differ so enormously. Then it will be but a step to the discovery of the reasons why each climate is ideal for the type of man evolved in and by it. We must give up the delusion that a man can live anywhere on earth without taking precautions to protect himself from new factors which did not injure him in his ancestral home.

The therapeutic importance of the matter is self-evident. Every now and then some case arises in which a change of climate is evidently imperative and the question at once arises as to what is the ideal. Shall we select a place for one characteristic, say elevation, or dryness, or would it be better to send him to one resembling his ancestral home. Should a consumptive Italian be sent to Scandinavia and a blond Swede sent to a place resembling Africa, where such types never have survived many generations? It is quite evident therefore that the patient must be studied far more than has been our habit, for perhaps we have been sending them in the wrong direction. Who knows but that the unfortunate results might thus be accounted for. There have been so few observations that we are not justified in dogmatizing, but enough is known to call a halt on our past methods and give a thought to physical type. Let every physician report both the successes and failures, and in time valuable generalizations will be possible. Let us remember that every climate is perfect for the types it has evolved, and more or less injurious to all others. Consequently, every place in America is doing some injury to the population except those whose ancestors came from a similar one. When we find what the injury is, then it is an easy matter to guard against it, and possibly a change might not be necessary. The benefit of cold air in tuberculosis may be due to the fact that the patient's physique needs it, and the startling, unexpected, unexpalined failures may be found to be due to the fact that the patient really needed a mild climate.

Another point to determine is the type of family which is surviving in each place in the greatest vigor, and here, too, the old family physicians have a wealth of data if they would only divulge it, for they could tell us of the disappearing types in each locality which has been settled a sufficient number of generations for noticeable results to have occurred. The doomed types might be saved by migration to a more suitable environment. The possibilities of life-saving are so great that there is no excuse for further neglect to keep accurate records of height, weight and color of hair and eyes and even head shape of each patient we treat.

OVERCROWDED TENEMENTS.

The congested population of city tenements has received much attention recently by reason of the numerous antituberculosis exhibitions. The conditions, though horrible in the extreme, are not a circumstance to what they once were, but they serve the double purpose of showing what an immense amount of good has already been accomplished by the numerous associations for bettering the conditions of the poor and also showing what an enormous task it will be to correct the evil entirely. It is rather amazing that popular interest is only now being aroused in America, whereas in England the reforms have been vigorously pushed for over fifty years. All the old world governments have always assumed more or less of a paternal attitude towards the people, but in America where the democratic spirit is carried to a point which resents governmental interference, every man is for himself and the devil takes the hindmost. Sanitary evils exist here which would not be tolerated in England where each man immediately appeals to the courts the instant he feels that his neighbor's liberty of action is injurious to him. Here we are free to do as we please even if we are injuring both our neighbors and ourselves. "The public be damned," is the cry of the poor as well as the famous rich man.

Happily this democratic callousness to the sufferings of others now seems to be at an end. A public conscience is being evolved and we are realizing that we ourselves are safer if we will only make life safe for others. We are like eggs in the same basket and what hurts one is apt to hurt all. Hence there is a tremendously powerful movement in the direction of preventing the Devil taking the hindmost. God helps those who help themselves and we need not break into His sphere, but devote ourselves to the neglected balance. The conditions of overcrowding are almost unbelievable,—six, eight, ten people, even more, crowd into an unlighted, unventilated room which is not fit for a pig sty. Conditions in Europe, if anything, are worse for it is more congested than the new world, and its cities have always been like rabbit-warrens. In Glasgow, for instance, there are nearly 100,000 people crowded into one-room dwellings, half of them live three or four to a room. It reminds one forcibly of the age of prehistory when men crowded into caves. Among the peasantry of to-day the same conditions exist, and several families occupy a single cottage, even sleeping on the floors as their ancestors have done for hundreds of thousands of years.

Of course disease must exist and these overcrowded areas are foci for the spread of almost everything which afflicts mankind, and in this

way the Devil gets the foremost about as often as the hindmost. The present problem is the eradication of these warrens, but how in the world is a laboring man to afford a house renting at twenty dollars per month when he makes only forty dollars and has a wife and six little children to feed? He must burrow like a rabbit or starve. There are not enough houses to go around or too many babies for the houses, according to the way we look at the appalling conditions. The whole question is far deeper than our charity workers imagine. The thinkers are dividing into two opposing camps, the old Malthusian one demanding a reduction of the birth rate and the modern school which is devoting its energies to the construction of model tenements, with public money if necessary, and then renting them to couples to fill with as many babies as they wish. Out of the maze of contradictions we see clearly two stupendous facts,—the birth rate is diminishing and the building rate increasing, so that each decade shows an improvement in the dreadful overcrowding. We would like to see the time when every man has decent housing for his family, but must confess that it is beyond our fondest hope, although conditions are constantly improving. Tuberculosis is bound to stay with us until the race has developed an immunity through the destruction of the susceptible—a process well under way now, for one-tenth of us are doomed, and the other nine-tenths resist the invaders or recover if infected. Overcrowding then is not remediable in the immediate future, and by the ordinary law of selection is exerting a tremendous influence in the evolution of resisting types. Whether or not the present antituberculosis crusade will be able to save these doomed ones, remains to be seen. We hope it will, but at present the ones most infected are those least able to afford the cure. To save and preserve them is a stupendous task requiring an organization and money now unattainable, if it ever will be.

LITERARY NOTES.

DR. MATIGNON, who has been for a number of years a resident of China, in the capacity of physician in the French Marine Corps, has recently published in the *Archives d'Anthropologie* some curious details relating to Chinese social customs. In the countries of the extreme East there is no need of societies, magazines, or theatres to uphold the sacred cause of the perpetuation of the species. In China, maternity is an honor and paternity one of the three greatest distinctions that can fall to the lot of a Celestial, the other two being a fortune and a manderinate, advances which imply all the privileges of officialism. All China has a desire

to increase the number of children. Filial duty—to-wit, passive obedience, respect, devotion, whether the parents are living or dead, being the fundamental idea of Chinese education, the necessity of creating a family becomes supreme. The sage, Confucius, whose ethics have controlled Chinese thought for two thousand years, declares that "the greatest offense dealt out to filial duty is for parents not to leave descendants." Regarding this matter at close range, the desire of a Chinese to have a progeny appears somewhat egotistical. He wishes for children,—sons, or at least one son, so that he shall not be neglected when he has passed away, since all good Celestials, just as all good Christians, believe in the life beyond. But his idea of a future life differs from ours, his conception bearing a close resemblance to life on earth with its joys and griefs. Hence his relatives and friends must see to it that his career in the other world is made as pleasant as possible. This can best be achieved by his eldest son, whose duty it is to have uppermost in his mind the care of the soul of his father. Without this earthly assistance unhappiness results, for nothing could be worse according to Chinese belief than the abandonment of a soul, so that it is compelled to mix with the legion of forlorn and deserted spirits who wander aimlessly around the living—spirits of those who died without descendants, of soldiers killed in war, and of marines who went to death in shipwrecks. This dread of the mysterious workings of the next world, of damnation when a soul is abandoned on account of no descendant to look after its wants, is the stimulant that has made reproduction, among the Chinese, a veritable cult. Perhaps the educated among us will regard so superstitious a belief unworthy of even passing notice, but when a superstition has a salutary result we should not look askance at it; and that it is effective in China cannot be gainsaid for its prosecution means much from a social point of view, since it has for its corollary the repopulation of this country. Thus the strength of the race and its supremacy are effected, so that, when at any future time, inroads are made by belligerent neighbors, numbers will not be lacking. As for maternity, it is a social and moral obligation for the Chinese woman, for it brings her nearer the ancestors who, though dead many years, are ever watchful over the destinies of the family, and make much of the fact that they are still remembered by inheritors. Thanks to her maternity, a Chinese woman can claim in turn to become an ancestor, and for her this is a pride that must be ranked with the supreme qualities. Thus the one desire of all young women is to have, above all, male offspring. The birth of a son at once gives a Chinese woman the coveted rank and privileges of a mother. In case only daughters are born, she is not considered a woman but is spoken of as a girl, and the name bestowed upon her is the equivalent of the English "Miss." But the day a boy is born, she becomes *ipso facto* "Madam" and can aspire to all the advantages which go with the Chinese conception of what is due the mother of a family. The intense desire of a Chinese woman for a male progeny manifests itself in divers ways. Votive offerings, novena, pilgrimages

to pagodas, and prayers are employed to transform the wish into a reality. In the temples, the goddess of maternity, who holds in her arms quite a number of baby boys in terra cotta, is the recipient of many offerings from pregnant women who desire a son, and who even go to the lengths of swallowing a piece of birch rod in the hope that by this pious (?) strategy the sex of the child will be determined. When one remembers of what importance the matter of maternity is with the Chinese, it will not be difficult to understand in what light female sterility is viewed. According to the terms of the Chinese law, it is just cause for repudiation and is ranked in the same category with jealousy, ungovernable temper, and gossiping, as matters which justify the casting off of the woman. The sterile wife, or the one who has born only daughters, occupies an inferior and rather despicable position in the household. Her husband, and especially her mother-in-law, leave no stone unturned to remind her of her ignominy; hence the role of this sort of daughter-in-law is irksome, to say the least. Sterility, which is considered a visitation of celestial chastisement, and the inability to have sons, which is but a lesser offense, justify the presence, in a Chinese household, of one or two concubines—"little wives" they are called—and the wife who has been completely subjugated is not unwilling to tolerate them, for if a concubine bears a son her position as a mother is at once recognized, not only by the husband but by the inevitable mother-in-law. As indicative of being only a vassal in the household, the day a concubine arrives she submissively gets down on all fours and crawls between the legs of the legal wife. Directly a son is born to her the sterile wife claims the child as her legitimate offspring and soon teaches it to call her "mother," while the concubine must remain content with the appellation of "aunt." This maternity *in partibus* bestows on the real wife all the advantages which would accrue, according to Chinese notions, from a maternity on more conventional lines. Peace is restored in the family, for the son will continue the lineage and will practice the cult of ancestors; and the tranquillity of the father is re-established because he knows his future is assured, since his son will give thought to his soul, when he has passed away. In short, a Chinese father desires a son for decidedly egotistic reasons, principally for his peace in the next world; while a Chinese mother is much more mundane, in so far as she well knows that by bearing a male child she in turn will become a mother-in-law, and have ample opportunities to avenge herself on her daughter-in-law for all the insults to which her own mother-in-law has subjected her.

ORIGINAL ARTICLES.

CURRENT CONCEPTIONS OF HYSTERIA.

By WILLIAM A. WHITE, M. D., of Washington, D. C.

CONTENTS.

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|-------------------------------------|---------------------------------|
| I. <i>Introduction.</i> | IV. <i>Biological Theories.</i> |
| II. <i>Psychological Theories.</i> | V. <i>Clinical Theories.</i> |
| III. <i>Physiological Theories.</i> | VI. <i>Conclusions.</i> |

I. *Introduction.*

The various phenomena now comprised under the term hysteria have always, throughout the period of man's history, been matters of interest, of mystery, and of speculation. It is only in recent times that it has been possible to approach the subject in a scientific way that offered hopes of getting somewhere, as it has only been in the last few years that adequate methods of investigating such problems as hysteria presents have been evolved.

The fundamental idea upon which present-day conceptions of hysteria are built is that the phenomena of hysteria are mental—that hysteria is a mental disorder—a psychosis, and not a neurosis as has been at times supposed. This idea has been of gradual growth, but has been slowly increasing until it has become a wide-spread conviction as a result of the constantly repeated observation that hysterical phenomena could be brought on, influenced, and made to disappear by means which in their last analysis were almost invariably shown to be, appeals more or less directly to the mind.

The psychic origin of hysteria is the prevailing note now running through its theoretical consideration. There are still, however, many phenomena, especially vaso-motor, secretory, and visceral upon which the several theories break. Some very easily escape from the difficulty by excluding such symptoms from their conception. Supposing hysteria to be a mental disorder, certain symptoms occur which are not mental, therefore, they are not hysterical—an excellent example of an argument in a circle. Others, because of these supposedly physical disturbances, prefer a theory more physiological than psychological.

The end result of all this seems to be quite clear—namely, that hysteria has not yet been defined, its inclusions and limitations are yet unknown.

To discuss a theory of an indefinable subject might be considered premature except that numerous theories actually do exist to account for the phenomena, and as a matter of fact the theories themselves are after all attempts at explaining the nature of hysteria, so that the discussion of theory goes along hand in hand with the attempt at definition.

In this paper it is my intention to discuss very briefly the most prominent of the hysteria theories, those especially which throw most light on the hysteria question. These theories can be divided, according to their predominant note, into psychological, physiological, biological, and clinical.

I will leave out of consideration, because I think them unimportant, the many attempts to explain hysterical phenomena from the purely physical side, such as the various chemical theories, the theories of auto-intoxication and the like.

II. *Psychological Theories.*

The strictly psychological theories have much in common and are the best known and most widely accepted. We can probably come to an understanding of these theories best by way of certain experimental work done on hysterics a number of years ago, especially by BINET.*

BINET's most significant work was done with the hysterical anesthetics. For example he placed a patient with anesthesia of the hand and arm so that the anesthetic arm was passed through a screen which shut it and the hand out from the patient's view. If now the skin of the hand was pinched or pricked, or the fingers seized and moved the patient felt nothing and could give no information as to the position of the fingers which were hidden from her sight. If a pen were placed in the anesthetic hand it was immediately grasped in the appropriate way between the thumb and index finger and the hand assumed the position of writing. This though the patient had no knowledge of what was going on. Let the experiment be still further complicated. With a pen in the anesthetic hand the hand was made to trace a word but in so doing an error was made in spelling. When this was done the hand would sometimes, still without the patient's knowledge, re-write the word correcting the error.

A still further elaboration and we have the phenomena of automatic handwriting. Not only will the anesthetic hand as above trace words, but some subjects will write page after page with no knowledge of what they are going to write and no conscious effort. Such writing is as novel to the subjects themselves when they come to read it as to strangers. The writing often contains information which is entirely new to the patients and as to the knowledge of which they can give no clue.

These experiments and many others of similar kind prove conclusively that the anesthetic hand is actuated in its movements by an intelligence.

*Binet: On Double Consciousness. Chicago: The Open Court Pub. Co. 1896.
Ibid. Alterations of Personality. New York: D. Appleton Co. 1896.

BINET concluded that there was a condition of double consciousness, that is, two streams of consciousness flowing side by side, relatively independent, and separated by amnesia.

This is well shown in one of my own experiments upon a case in which this class of phenomena was studied by Dr. SIDIS* and myself.

The subject in her normal state was given a book; she was directed to read aloud to some one in the room, in a slow, clear tone, taking pains meanwhile to understand clearly what she was reading. While she was reading I approached her from behind and spoke to her in a low tone of voice, directing her to raise her right hand to the table; the hand obeyed; I placed a pencil in the hand, and the hand grasped it. Now any question that was propounded to her was answered in writing while she continued to read aloud. If a suggestion of a visual hallucination was given to her, the hand wrote, in reply to a question, that she saw the thing suggested. It was noticeable, however, that the two processes interfered with one another, and that while one was carried on at its best the other was interrupted and hesitating. When she stopped reading, she had no recollection of anything said or suggested, and her remembrance of what she had read was rather indistinct. If, however, she was hypnotized after one of these experiments, she remembered everything said and what her written replies had been. When questioned once during this period of distraction about an hallucination of a rose which had been given her in a former hypnotic state, and asked if she remembered it, the hand wrote "Yes," asked what she did with it, the hand wrote "I gave it to Mrs. S.," which was a correct answer and showed complete recollection of the hallucination. Questioned after she finished reading, she had no recollection either of the hypnotic state or of the answers her hand had written.

Here we again have evidence of two streams of consciousness separated by amnesia. The experiments also indicate that areas of hysterical anesthesia, in this case anesthesia of the hand, are connected with the submerged stream of consciousness, and further that the hypnotic state is such a submerged stream temporarily brought to the surface during hypnosis but sinking back again during the waking, normal state.

Similar demonstrations were made with other anesthetics. For example, retinal anesthesia. Objects so placed as to be reflected on the anesthetic area, could of course not be seen, but it was shown both by automatic handwriting, and by hypnosis that the patient actually had full knowledge of them.

With this introduction we are in a position to take up the modern dissociation theories of hysteria. The first one I will describe will be that of the eminent Parisian psychologist, Dr. PIERRE JANET.

JANET** believes hysteria to be entirely a mental malady. This conception he clearly outlined in his address on the subject at the Amsterdam

*Sidis and White: *Mental Dissociation in Functional Psychosis in Sidis*; Psychopathological Researches. New York: G. E. Stechert. 1902.

**Janet: *L'Hystérie maladie mentale*. 1^{er} Congrès International de Psychiatrie, de Neurologie, de Psychologie et de l'Assistance des aliénés. Amsterdam, 1907.

Congress in 1907. There and in his latest work* he sums up his views and defines hysteria in purely mental terms.

For him there exists in consciousness a region below, if such a term be permissible, the normal waking, or personal consciousness, which is called the subconscious. Groups of ideas may exist in this, so to speak, twilight region without being at all clearly perceived by the individual—in fact without being known at all, and yet they may operate to produce results very much as if they were the subject of voluntary attention. The hysteric in an access of delirium lives through fancied experiences about which he knows nothing when he “comes to;” he has an amnesia for all of these events.

The hysterical amnesia does not confine its manifestations to such conditions but invades the details of everyday life. The patient who is sent on an errand forgets what she is sent for before she gets half way to her destination. This is a simple, but common example. JANET would explain this by a disorder of attention. The directions are imparted to the patient but they are not acutely attended to and drop at once into the region of the subconscious—they are forgotten by the waking, personal consciousness. The anesthetic arm is explained in the same way. The patient does not attend sufficiently to the sensations from the arm to perceive them.

The hysterical symptoms then are dependent upon an increase in the field of the subconscious and correspondingly in its activities dependent upon a defect of attention and resulting in a narrowing of the field of the personal consciousness. In fact the narrowing of the field of the personal consciousness and the defect of attention are different sides of the same phenomenon. Events do not come into the clear light of the acute waking self, they are not perceived within the field of the attentive, personal consciousness, they fall outside into the subliminal, subconscious region.

It will be seen then that this process of enriching the subconscious does so at the expense of the personal consciousness. It is the synthesis of mental processes into a coherent whole that constitutes the personality. The hysterical process causes a splitting up, a disintegration, or as JANET says, a doubling of the personality. He thus comes to the definition of hysteria as “A form of mental depression characterized by the retraction of the field of personal consciousness and by the tendency to the dissociation and the emancipation of systems of ideas which by their synthesis constitute the personality.”

A prominent feature of JANET'S theory is that he believes the hypnotic state to be the same thing as an hysterical somnambulism. In other words, to be suggestible is to be hysterical and only hysterics can be hypnotized.

The essential things in JANET'S theory are then the tendency to dis-

*Janet: *Les Névroses*. Paris, 1909.

integration, splitting up, or as he says doubling (*dédoulement*) of the personality, its outward sign the presence of a pseudo-amnesia due to defect of attention, and the identity of the hysterical and the hypnotic states based upon the common factor of suggestibility.

SIDIS' theory is similarly a dissociation theory. SIDIS, however, lays more stress upon the process of dissociation, and the independent, automatic activity of the subconscious ideas or systems.

The crises of hysteria are due to the automatic activity of these dissociated ideas, or better, as SIDIS* says, constellations. Ideas alone have no existence, not only are they indissolubly bound up with a feeling—tone, but they necessarily exist only in association. To a group of ideas associated together, or more properly to a mental state grouped about a central idea or event, SIDIS gives the name "constellation." It is these constellations that exist dissociated and more or less independent in the subconsciousness.

The dissociation having once begun tends to continue and new material is constantly being added to the subconsciousness by further cleavage and also by assimilation by this state itself as it begins to lead an independent existence—secondary state. Thus the tendency is for it to continually grow, and when that growth takes place by repeated cleavage, to grow at the expense of the personal consciousness.

These split-off constellations tend always to become dynamic. In the normally functioning mind there is constantly going on a "battle of motives," a struggle for supremacy among the different tendencies present, not unlike the struggle which has been described among the physical elements of the body and which leads to certain structural types. The result is that differences of tension—psychological tension JANET would probably say—tend to occur in the various systems. As these systems are all connected intimately by association, discharge takes place along the lines of least resistance and so drains the systems at high tension—inhibition by drainage as McDougall** would have it.

Now, in these dissociated states, separated from the personal consciousness by a plane of cleavage, energy accumulates, and because of an absence of avenues of association through which drainage can take place, accumulates to the point of explosion and breaks over the gap separating it from the upper or personal consciousness producing a paroxysm.

On the other hand, during periods of inactivity of the upper consciousness, as in hypnotic, hypnoidal, and dream states, the secondary states tend to assume the ascendancy.

Whether the secondary states ever assume the dignity of a personality or not is merely a question of degree. They tend to organize and to grow and if the process keeps up it is only a question of time when a new personality will be born. If these states grow largely at the ex-

*Sidis: *Psychopathological Researches*. New York: G. E. Stechert. 1902.

**McDougall: *The Nature of Inhibitory Processes Within the Nervous System*. Brain. 1903.

pense of the personal consciousness this latter may finally assume a position of relative inferiority.

SIDIS' theory of the hysteric state and the hysteric attacks is closely bound up with his therapeutic ideas and really can only be fully understood by taking them into consideration.

His principle of treatment is by reassociation of the dissociated states. The secondary state is gradually merged into the upper consciousness so that the cured patient no longer has two independent states separated by an amnesia but the events of both states are fully known to the personal consciousness. A significant fact is that the cured patient is no longer hypnotizable, which speaks strongly for JANET's position as to the identity of the hysterical and hypnotic states.

This cure is brought about through the intermediation of the hypnoidal state—a state SIDIS* places between waking and sleep on the one hand and hypnosis on the other. It is, he believes, the primitive rest state of animals and in the higher animals has developed by differentiations into sleep. Under certain conditions, however, hypnosis may develop instead of sleep. The therapeutic value of the hypnoidal state is due to its being the portal to the psychic "reserve energy."

As we are all possessed of more liver, more kidney, more everything than is necessary for our ordinary needs and are supplied with a large surplus to be called on in times of emergency, so it is with psychic energy. Through the utilization of the psychic reserve energy the dissociated systems may be restored to equilibrium.**

The main features of SIDIS' theory then are—the process of dissociation, the principle of dynamogenesis and automatic activity of the dissociated systems, the cure by reassociation, and the principle of reserve energy and its accessibility through the hypnoidal state. :

BREUER and FREUD, in their "Studies"† published in 1895, set forth also a modification of the explanation by dissociation. They, however, devoted more attention to the process and causes of the dissociation. For them dissociation occurred at the moment of psychic trauma. It might be the result of a single severe shock or a multitude of small ones.

The reason the dissociated states are able to continue actively and in their original clearness year after year without growing dimmer as time goes on as do other mental states, is that they are isolated from the upper consciousness and from the world of events in general and are therefore not thrown into the background and rendered obscure and buried by the rush of events day by day.

The characteristic of the psychic trauma which produces hysteria is its large content of painful affect. A painful affect fully reacted to

*Sidis: An Experimental Study of Sleep. Jour. of Abnormal Psych., Vol. III., Nos. 1, 2 and 3. 1908.

**Sidis: Studies in Psychopathology. Boston Med. and Surg. Jour., Vol. CLVI., Nos. 11, 12, 13, 14 and 15. 1907.

†Breuer and Freud: Studien über Hysterie. Leipzig und Wien; Franz Deuticke. 1895.

at the time may produce no harm, but if for any reason reaction fails, and the feelings are contained and repressed, the possibilities of dissociation are created.

Failure of reaction may be due to the failure of conditions that make efficient reaction possible, as for example, an insult is "swallowed" or a dear friend or parent who can not be replaced, or for whose loss there seems to be no compensation, is lost by death. This gives rise to "retention hysteria." Again ideas, usually of a sexual nature, which are incompatible with the personal consciousness are repressed—reaction is not permitted, no effectual "catharsis" takes place. This condition produces "defense-hysteria." Finally experiences occur in a hypnoid state. This is a condition midway between waking and hypnosis, a dreamy state of mind such as is favored, for example, by the needle work that women do so universally. The essential point is, however, that it is a split-off, dissociated state. Events occurring in this state of mind never having reached the personal consciousness, have of necessity and by implication always been dissociated—they produce the so-called "hypnoid hysteria." FREUD is inclined, however, to find the real basis of all three varieties in the principle of defense.*

The final principle of the BREUER-FREUD theory is the principle of conversion. The strangulated affect, the unreacted-to emotion, belonging to the dissociated state which has been repressed, finds its way into bodily innervation thus producing the motor phenomena of hysteria. In this way the strong idea is weakened by being robbed of its affect—the real object of conversion.

From 1895 on BREUER's activity in the realm of hysteria ceased. FREUD, however, continued his investigations and elaborated still further the position he took in the "Studies."

The really most important and significant feature of FREUD's** theory is the tracing of every case to a trauma of sexual nature. Not only does hysteria always originate in sexual traumatism but the original traumatic moment must have been in childhood—in the pre-pubescent period.

These infantile sexual traumas are of the nature of seduction by grown people or older children, they consist of actual irritation of the genitals (coitus-like processes), and occur before puberty (which occurs earlier in the psychic sphere than the maturing of the body). FREUD has traced this class of traumas to very early life, three and four years of age, and in one instance actually to one and one-half or two years.

The reason why sexual experiences of infancy and early childhood are so potent for trouble in later years is because of the peculiarity, in one particular, that sexual experiences have—differing in this respect from all other psychic experiences. Ordinarily a mental experience once had tends to fade out and become progressively more indistinct as time goes

*White: The Theory of the "Complex." Interstate Med. Jour., Vol. XVI., No. 4, 1909.

**Freud: Selected Papers on Hysteria and Other Psychoneuroses, Nerv. and Ment. Dis. Monograph Series No. 4. New York, 1909.

by. Sexual ideas produce actual genital excitement. Now—if these ideas which originated before sexual maturity are revived after sexual maturity, puberty having intervened in the meantime, has rendered the affective and genital capacity for reaction much greater so that the response instead of being less has actually accumulated powers for being greater. This disproportionate capacity for increased reaction taking place in the subconscious is responsible for the mischief. In the words of FREUD “hysteria is the expression of a special behavior of the sexual function of the individual” and “this behavior was already decisively determined by the first effective influences and experiences of childhood.”

These infantile sexual traumas form the necessary precondition for the outcrop of hysterical symptoms in later life. These symptoms may be produced by the most banal occurrences and even by bodily traumatism.

There must, however, be a connecting link between the infantile sexual trauma and the later manifestations. This connection FREUD finds in the so-called “hysterical fancies.” These are the “day dreams” of erotic coloring, “wish gratifications” originating in privation and longing. These fancies hark back to the original traumatic moment and either originating in the subconscious or shortly becoming subconscious are transformed into hysterical symptoms. They constitute a “defense” of the ego against the revival as reminiscences of the repressed traumatic experiences of childhood.

We find, therefore, an infantile sexual trauma which has been repressed. In certain individuals this repression results in an independent activity of the repressed experiences. These repressed experiences condition the erotic fancies which take forms incompatible with the personality and are in turn repressed. The repressed ideas are rendered harmless, greatly weakened, by the transformation of their affective excitement into bodily innervation—a process FREUD calls “conversion” while the mental symptoms of the attack represent the incursions of the erotic day-dreams to the surface. This is FREUD’s words: “Psychoanalysis of hysterical individuals show that the malady is the result of the conflict between the libido and the sexual repression, and that their symptoms have the value of a compromise between both psychic streams.”

III. *Physiological Theories.*

The only one of the physiological theories which is of sufficient prominence to be taken up at this time is that of SOLLIER.* His definition of hysteria is as follows: “Hysteria is a physical, functional disturbance of the brain, consisting in a torpor or a sleep, localized or generalized, temporary or permanent, of the cerebral centers, and manifesting itself consequently according to the centers affected by vaso-motor or trophic, visceral, sensory and motor, and finally psychic disturbances, and, according to its variations, its degree and duration, by transitory crises,

*Sollier: *Hystérie* and *Sommell*. Arch de Neurol. Mai et Juin, 1907.

permanent stigmata or paroxysmal accidents. Confirmed hysterics are only vigilambulists, whose state of sleep is more or less profound, more or less extensive."

This definition is nothing but a statement of dissociation in physiological terms. An explanation still further removed for while dissociation may be a theory it is an interpretation of certain psychic facts. SOLLIER's hypothesis is, on the contrary, purely conjectural without any facts additional to those of the dissociationist on which to rest. It is interesting and without the other theories might be helpful but it has no facts to support it.

IV. *Biological Theories.*

In the consideration of the psychological theories of hysteria it was shown how the hysterical manifestations were a result of dissociation. This dissociation occurs in the realm of the personal consciousness and constitutes a breaking down, a disintegration of the personality. It would seem to follow from this view that dissociation and disintegration of the personality would occur in those individuals in whom the synthesis of the personality was defective, that is, in persons in whom the elements that go to make up the personality are not being held together, not closely knitted by association but fall apart upon slight provocation.

This is a conception of the hysterical type which is essentially biological. SNYDER* holds hysteria to be a mode of reaction in persons of naive, simple, infantile mentality. A mentality lacking in development and defective in judgment and critique. Such individuals placed in a new environment to which they can not adapt, or adapt only with difficulty, develop the hysterical type of reaction.

Similarly—as hysteria is a manifestation of an infantile mentality so it is, when considered racially, the manifestation of the infancy of the race, of people who are primitive and simple. For example KRAEPELIN** found it very prevalent among the natives of Java. That and dementia precox were the most prevalent of mental disorders—both disorders incident to poor development of the mental powers.

SNYDER would explain the outbreaks of hysteria among the masses that occurred so frequently in the middle ages as the result of the repression of the human spirit. Wherever the aspirations, the reachings out, the efforts to go ahead have been repressed, as they were by the conservative forces of society during the middle ages, then hysteria comes to the front and as the repressive forces operated on all the people alike we find the reaction commensurately widely distributed. This is the period of the "infancy of individualism" according to HELLPACH† who thinks that the socialistic aspirations of the proletariat of to-day are the equivalent of the hysteria of the masses of the middle ages.

*Snyder: *Définition et nature de l'hystérie*. L'Encéphale. Aout, 1907.

**Cited by Jelliffe: *Hysteria and the Reeducation Method of Dubois*. N. Y. Med. Jour., May 16, 1908.

†Cited by Snyder, loc cit.

It is at least interesting to contemplate, in the light of FREUD's ideas of repression and retention, that the individual through many avenues, public speaking, newspapers, etc., has many ways open of letting off steam, means for emotional catharsis that were denied him in times past.

CLAPAREDE* in his consideration of hysteria lays special stress upon the fact that the hysteric shows a marked resistance to the recall of painful memories which he considers to be biologically a defense reaction. Equally also is suggestibility a defense reaction against personal peculiarities and tendencies which never could be given free play or they would isolate the individual from the social world in which he lived. Instead of yielding to these impulses the suggestion of another is followed because safer.

The theory of CLAPAREDE** is a portion of a broader theory which would explain sleep, not as it is usually explained, as a negative function, but as a positive function. We do not sleep accordingly because we are exhausted but in order not to be. In other words, sleep is a function of defense. It makes itself felt before real fatigue. Prevent the animal from sleeping and it becomes exhausted.

This digression into the theory of sleep is interesting because of the close relation sleep bears in theory to hysteria. SIDIS† in recent studies has come to the conclusion that the primitive state of rest in animals is a semi-waking state to which he gives the name, hypnoidal. Out of this state there develops on the one hand sleep—on the other the hypnotic state, so that it is impossible to pass into or out of the sleeping or hypnotic state without passing through the hypnoidal.

The consideration of sleep from a biological standpoint is especially interesting. CLAPAREDE considers both sleep and hysteria as being defense reactions, while SIDIS develops both sleep and hypnosis from a primitive hypnoidal state. These facts are particularly significant when we recall that JANET believes that to be hysterical is identical with being hypnotizable. Then BERNHEIM, for instance, believes the state of hypnosis to be clearly allied to sleep and now lately we find McDUGALL‡ pointing the similarities between sleep and hypnosis, and explaining hypnosis as a state of dissociation, and treating of the dynamics of the dissociated states in a way quite like what we are already familiar with.

V. *Clinical Theories.*

What I have called here clinical theories might almost better be called clinical definitions. The very attempt to define, however, although perhaps not primarily directed to a discovery of the nature of the thing defined must by implication consider it.

*Claparède: *Quelque mots sur la définition de l'hystérie*, Arch de Psych., Oct., 1907.

**Claparède: *Esquisse d'une théorie biologi. que du sommeil*, Arch de Psych., Tome 4, Nos. 15 and 16, Feb. and Mch., 1905. Revised by Vaschide: *La Théorie Biologique du Sommeil de M. Claparède* Revue de Psych. Ap., 1907.

†Sidis: *Loc cit.*

‡McDougall: *The State of the Brain During Hypnosis*. Brain, Vol. XXXI., 1908.

The principal author to be considered here, because of the great attention his pronouncement relative to hysteria has received, is BABINSKI, and we will see that whereas his effort is primarily addressed to the definition of hysteria, still it necessarily implies somewhat of its nature.

The fundamental proposition of BABINSKI* is that the hysterical phenomena are distinguished by the fact that it is possible in certain subjects to "reproduce them by suggestion" "with vigorous exactitude" and "cause them to disappear under the exclusive influence of persuasion."

His distinction between suggestion and persuasion is to my mind wholly academic. It is suggestion to influence a patient to accept an idea which offends the reason, which is manifestly irrational, while it is persuasion if the idea is reasonable, rational.

BABINSKI believes that a large number of the symptoms manifested by the hysteric are caused by the examinations of the physician. The methods employed, for example, to determine the presence or absence of anesthetics, suggest these very anesthetics to the patient who forthwith presents them. This I think you will admit is true in not a few instances.

Similarly he would exclude from the realm of hysteria disturbances of the tendon reflexes, cutaneous ecchymoses, paralysis of the third nerve, anesthetics of the cornea and conjunctiva, inequality of pupils, mydriasis, visceral hemorrhages—hemoptysis and hematemesis—anuria, fever, etc.

It will thus be seen that BABINSKI relegates the phenomena of hysteria to the psyche and to the higher psychic functions at that.

It is interesting to note further that for him hysteria and hypnosis are the same except that hypnosis requires the intervention of a second person to develop its manifestations while hysteria does not.

VI. *Conclusions.*

From a consideration of all these theories it seems to me that the most fruitful conception of hysteria is that expressed by JANET in the phrase "weakening of the faculty of psychological synthesis." The personality, which is the highest expression of the psyche, the acme of complexity of association in a harmonious psychological synthesis, tends rather easily to fall apart. The associations are not sufficiently strong, sufficiently binding and it splits up under the influence of certain kinds of stresses. This aptitude for disintegration has both an ontogenetic and a phylogenetic substratum. It is the infantile mentality that is thus affected and when hysteria has manifested itself in the masses, the people have been afflicted while the race was in its childhood.

As to the manifestations of the hysterical type of reaction their number is legion, their forms protean. All attempts up to the present time to gather them together within a given definition have, to my mind, been quite futile.

From a conception of hysteria that admits a symptomatology covering

*Babinski: *My Conception of Hysteria and Hypnotism*. *Alienist and Neurologist*, Vol. XXIX., Feb., 1908.

the entire realm of nervous and even visceral disorders, implicating both the psyche and the unquestionably physical bodily processes the effort of BABINSKI is a reaction while BERNHEIM* goes even further and says "hysteria is not a morbid entity, it is not a disease," "the disease hysteria, such as is described, does not exist." BERNHEIM** would reserve the name hysteria solely for the crises, a position some others also take. In harmony with this tendency we see coming into general use the word "hysteriform" to express conditions which resemble hysteria but because of associations with others conditions are supposed not to be.

The whole question of the relation of hysteria to other diseases, to mental diseases such as dementia precox, to neuroses such as epilepsy, to multiple sclerosis, chorea, etc., has been admirably and sanely reviewed by Voss† in his recent work.

If, as seems to be generally acknowledged, the hysterical Anlage, the tendency to hysteria, or hysterisability as BERNHEIM would have it, may remain indefinitely latent until something happens to produce the characteristic response, then I do not see why the so-called hysteriform accompaniments of these various diseases cannot properly be considered as true hysteria. Why should not a multiple sclerosis be the activating agent in breaking down the resistance to the outcrop of the hysterical reaction?

All these efforts to limit, to bind in, to define hysteria within certain prescribed boundaries are not at all convincing and they fail, it seems to me, simply because hysteria does not confine its manifestations to any definite limits. It spreads out into all the available and adjoining territory and is indefinite and hazy in its outlines quite like other natural phenomena. We must not forget that definitions are human devices—nature has few sharply defined boundaries.

The effort of BABINSKI to exclude all phenomena which seem to be physical in character seems to rest on entirely inadequate conceptions. The whole field of psychopathology has too long been dominated by that bug-a-boo, the relation of the mental and the physical and the implied necessity of conceiving of each as in essence different from the other. This is but another example of an attempt to define an artificial boundary where none exists.

As between the most definitely physical of bodily processes on the one hand and the highest psychic on the other, an infinity of gradations exists and at no point can it be said that what was one has become the other. It is much more stimulating and effective to stick to facts wherever they may lead us than to create arbitrary boundaries which later on only serve to cut off our entrance to certain territories.

It seems to be very well demonstrated that the individual reacts to conditions by the development and organization of mechanisms which in their complex manifestations may include both physical and mental components.

*Bernheim: *Conception du mot Hystérie*. Paris, 1904.

**Bernheim: *Loc cit.*

†Voss: *Klinische Beiträge zur Lehre von der Hysterie*. Jena, Gustav Fischer, 1909.

This has recently been exceptionally well shown by the work of PAWLOW* on the salivary secretion in dogs. He has shown that the physiological process, the flow of saliva, could be brought about reflexly by stimuli of sight, sound, touch, temperature, or odor provided only the stimulus had previously been applied in association with the giving of food. Having applied the stimulus originally thus associated so that it entered into and became a part of the mechanism of the dog's reaction to the food, later the reaction took place by the application of the stimulus although the association with the food was left out. The physiological process had become organically linked with the psychic stimulus. In other words a mechanism was created which acted as a whole. Like a watch, the parts were so intimately related that no portion could be set in motion without setting the whole going.

Even when a portion of the mechanism is destroyed the rest often still operates. The decerebrate dog turns and growls and bites at the fingers that hold his hind foot too roughly. Here there cannot be any possibility of the psychic state of anger, as SHERRINGTON** says, "The action occurs, and plays the pantomime of feeling; but no feeling comes to pass."

The action of a complex mechanism as a whole is shown exceptionally well in a case reported by PRINCE.† The patient was subject to hay fever in a very severe form when exposed to roses. On one occasion a bunch of roses was unexpectedly produced from behind a screen. A severe attack followed with lachrymation, congestion of the mucosa, dyspnoea, etc., although the roses, unknown to the patient, were but paper. Here a pure psychic fact at one end of the scale produces a set of reactions which at the other gives rise to sensory, motor, vaso-motor, and secretory disturbances which can hardly be conceived to be even remotely psychic. The important fact is that from the one to the other is an uninterrupted chain of associations.

It seems to me that in a consideration of such facts we may find an explanation for the association of physiological disturbances with hysteria, such as the false gastropathies for instance, and also an explanation of those cases which start as hysteria apparently but which later on show symptoms of permanent mental deterioration. Those cases, which lead to a change of diagnosis from hysteria to dementia precox, also lead to the belief that the original diagnosis was in error. Why? Could it not be possible for a hysterical type of reaction in a badly organized individual to gradually unloose bits of physiological mechanism until organic changes had wrought permanent damage?

And so I think we must come to recognize the hysterical type of reaction wherever we see it whether in connection with other conditions or alone. By so doing we will have a broader understanding of our cases than by always insisting upon a one-disease diagnosis.

*Yerkes and Morgulis: *The Method of Pawlow in Animal Psychology*. Psych. Bulletin, Aug. 15, 1909.

**Sherrington: *The Integrative Action of the Nervous System*. London: Archibald Constable & Co. 1906.

†Prince: *The Unconscious*. Jour. of Abnormal Psych., Vol. III., Nos. 4, 5 and 6; Vol. IV., No. 1.

PRACTICAL POINTS IN THE OFFICE TREATMENT OF RETRODISPLACEMENT OF THE UTERUS.*

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When honored with the request to speak before your Society, I inquired what was wanted. The reply was "Some gynecological subject, presented in a way that will be helpful to the general practitioner." Consequently my remarks are framed with that object in view.

Most cases of retrodisplacement are seen first by the general practitioner. Certain classes of cases of this very common affection can be handled satisfactorily by the family physician, provided he is familiar with the therapeutic measures employed and with the selection of the cases. I shall consider therefore certain practical points—first, in regard to the measures employed and, second, in regard to the selection of cases.

THERAPEUTIC MEASURES.

The particular measures which in my experience have proven most useful in the office treatment of retrodisplacement are three, viz: (a) bimanual manipulation toward reposition, (b) pessaries and (c) the knee-chest posture. Other measures are occasionally beneficial, such as the mercury pressure-weight treatment, regular pelvic massage, special tampons, etc. But the three measures first mentioned are the most dependable ones, and they will prove effective in practically all cases which are really suitable for non-operative treatment.

To the general practitioner studying how to handle these cases satisfactorily I say: "Make a careful study of these three measures. Know just how to use them, just what can be accomplished by them, and just what cases are suitable for them." Much more can be accomplished toward effective treatment by devoting what time you can spare to a thorough study and careful use of these measures than by spreading that time out over various things of doubtful value. As a rule, when these three measures well carried out fail to give satisfactory relief the case is not one for office treatment but for operative treatment.

BIMANUAL MANIPULATION TOWARD REPOSITION.

The diagnosis of backward displacement of the uterus having been established, the next thing is to find out what complications exist. Care-

*Read, by invitation, before the St. Louis County Medical Association, October 13, 1909.

ful bimanual palpation is made in all parts of the pelvis—in the lateral portion at each side and also anteriorly and posteriorly. In this palpation, search is made for a mass, for induration and for abnormal tenderness. Note, also, if there is relaxation of pelvic floor, laceration of cervix, endometritis, fibroids, etc. Having determined the complications, then try to replace the uterus by bimanual manipulation.

To be effective, this *bimanual manipulation* should be carried out in a systematic way, with a definite object in view at each step. First, with two fingers in the vagina back of the cervix, the corpus uteri is pushed directly upward (Fig. 1). It may yield to this upward pressure or it may not. If it can not be thus raised, then slip a tenaculum forceps into the vagina, beside the examining fingers, and catch the cervix and pull it forward, as shown in Fig. 2. This accomplishes two things—it brings the whole uterus forward so that the fundus can swing clear of the promontory of the sacrum, and also it brings the uterus closer to the examining hand so that the fingers can pass farther up its posterior surface. The attempt to replace the uterus, divides the cases into three classes, based upon the mobility of the organ, viz., "uterus freely movable," "uterus partially movable," and "uterus fixed." Let us now take up these classes and see how bimanual manipulation may be used to advantage in each.

UTERUS FREELY MOVABLE. If the fundus uteri can be pushed upward by the vaginal fingers, it is raised more and more (Fig. 3) until the fingers of the other hand pressing in from the abdomen can be hooked back of it, as indicated in Fig. 4. Then the fundus is brought forward by the abdominal fingers, and at the same time the cervix is pushed backward and upward by the vaginal fingers (Fig. 5). This accomplishes replacement of the uterus. Now while the cervix is held firmly by the second finger behind and the index finger in front, the corpus uteri is bent well forward over the index finger, so as to take out any backward flexion that may be present (Fig. 6). If there is difficulty in the replacement, it may be aided by catching the cervix with a tenaculum forceps, as before mentioned, and bringing the organ down within better reach of the examining fingers. After the uterus is replaced, a suitable pessary is introduced to keep it in place.

I have gone somewhat into detail in regard to the steps in bimanual reposition because of the importance of a complete understanding of them. It appears a very simple matter, and it is very simple and easily executed in some cases. In other cases, however, there is failure, and unless you have a clear understanding of how each step is carried out and what it should accomplish, you may not be able to overcome the difficulty or even to locate it exactly.

There are various conditions, occurring with movable retrodisplacement, that interfere more or less with bimanual replacement.

Obesity. A thick abdominal wall may prevent the abdominal fingers from getting back of the raised fundus uteri to bring it forward.

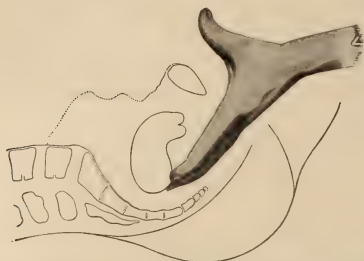


Fig. 1. Attempting to raise the fundus uteri, to determine whether or not it is fixed. This is also the first step in Bimanual Replacement of the Uterus.—(Pryor.)



Fig. 2. The cervix caught with a tenaculum-forceps and pulled forward so the fundus will swing clear of the sacral promontory. (Kelly.)

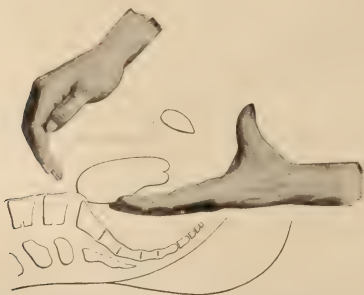


Fig. 3. Bimanual Replacement. Raising the fundus uteri past the sacral promontory. (Pryor.)

If a good trial at bimanual reposition does not succeed, then the knee-chest posture may be employed. When the patient is in the knee-chest posture, introduce a Sims speculum, catch the cervix with a tenaculum-forceps and bring it well forward, so the fundus uteri can swing clear of the sacral promontory. Then carry the cervix well backward and upward in the pelvis with the attached tenaculum. If the corpus uteri seems to go well forward, a pessary may be introduced while the patient is still in the knee-chest posture. If a suitable pessary is not at hand, a tamponade may be used. Whether a pessary or tamponade is used, it should be adjusted so as to hold the cervix well back in the pelvis. In the subsequent treatment of such a case, the knee-chest posture should be used regularly, as explained later.

Abdominal Tension. This prevents deep palpation by the abdominal hand. It is often due to fear of pain on the part of the patient. A reassuring explanation that there will be no pain, will tend to relieve this, as will also gentleness during the examination. After the patient has become convinced that the examination is being made carefully and that there will be no sudden severe pain, the muscular and nervous tension relaxes. In such cases, at the end of a careful examination the uterus may sometimes be brought forward into position, while near the beginning of the examination no progress could be made in that direction. Also, deep inspiration and expiration tends to relax the abdominal muscles.

Pelvic Tenderness. The tenderness may be due to an inflammatory focus somewhere in the pelvis, or to a prolapsed tender ovary back of the uterus, or simply to hyperesthesia of the pelvic structures, as part of a general hyperesthetic condition of the nervous system. Whatever the cause of the tenderness, it prevents elevation of the corpus uteri and forward replacement of the same. A few days' treatment with hot douches and rest, may diminish the tenderness so that at a subsequent treatment there is less tenderness and replacement may be effected. In the meantime, the knee-chest posture taken regularly morning and evening will tend to improve the position of the uterus without direct pressure upon the tender structures. If the tenderness is due to acute inflammation in the pelvis, treatment should be directed toward that entirely, without reference to the displacement.

Small Vaginal Opening. When the vaginal opening is small, bimanual reposition can not be carried out satisfactorily. Two fingers in the vagina are usually necessary to effect reposition, and in the case of a married woman these can, as a rule, be introduced without difficulty. On the other hand, in the virgin, only one finger can be introduced, and that with difficulty. What shall be done?

In some of these cases the uterus is still small and its displacement is not of much clinical significance. In such a case, other conditions are to be treated and little or no attention paid to the displacement. If the uterus is large and there are symptoms evidently due to the displacement,



Fig. 4. Bimanual Replacement. Working the abdominal fingers down over the sacral promontory, so as to get behind the fundus uteri and bring it forward. (Pryor.)

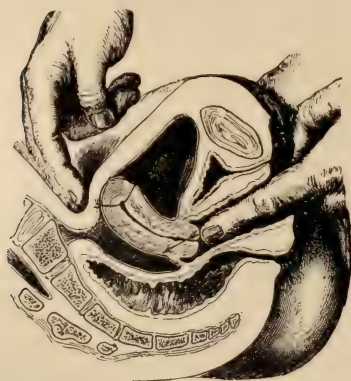


Fig. 5. Bimanual Replacement. Bringing the fundus forward and pushing the cervix backward. (Kelly.)

have the patient take the knee-chest posture regularly morning and evening. If this does not correct the trouble sufficiently to give relief, then examine the patient under anesthesia. Under anesthesia a thorough examination of the pelvis can be made, the uterus can be brought into proper position if not adherent, and the small vaginal opening may be stretched so that a pessary may be used later if necessary. If the patient has painful menstruation or excessive menstruation, arrangements should be made for thorough dilatation and curettage at the same time. In many virgins the difficulties of pelvic examination are such that an examination under anesthesia is necessary in order to determine what lies back of the symptoms.

Senile Uterus. The retrodisplaced uterus is sometimes very small from senile atrophy. This, of course, is found only in patients well past the menopause. In the cases referred to, the uterus, though freely movable, is so small (both cervix and corpus) that it is a difficult matter to catch the fundus and bring it forward, and still more difficult to maintain it in the forward position. My experience with these cases is that the displacement rarely causes symptoms. The corpus uteri is so small and light that it is a matter of indifference whether the atrophic organ lies forward or backward. A careful consideration of the case will usually show that the symptoms are due to some other disturbance, most frequently to senile vaginitis and vulvitis (pruritis vulvæ). Of course there are many women who have troublesome symptoms from a retrodisplaced uterus long after the menopause, but these are cases in which the uterus has failed to undergo the senile atrophy or there are complications which aggravate the trouble. One of the conclusions I have drawn from my experience, is that the symptoms from a movable displaced uterus, aside from complications, depend largely upon the size of the organ. In the child-bearing period when the uterus is large, heavy, and functioning, its backward displacement practically always gives troublesome symptoms as long as the uterus is movable. I do not recall any case of decided backward displacement of a movable functioning uterus of good size that did not present troublesome symptoms. On the other hand, I have seen several cases of small movable displaced uterus in the aged without symptoms, and also a few cases of small movable displaced uterus in the virgin without symptoms. The only cases in which I have seen displacement of a large, heavy uterus without symptoms, were those in which the uterus was firmly fixed, so firmly fixed that there could be no dragging. An occasional instance of this kind has come under my observation, and such cases are very instructive, for they indicate that the symptoms in displacement of the uterus are due not to the abnormal location of the corpus uteri but to the dragging on stretched and tender structures. This same fact is of much importance also in operative treatment, and indicates the wisdom of choosing those forms of operation which not only bring the uterus forward but at the same time elevate it, and thus overcome the dragging and partial prolapse which is usually

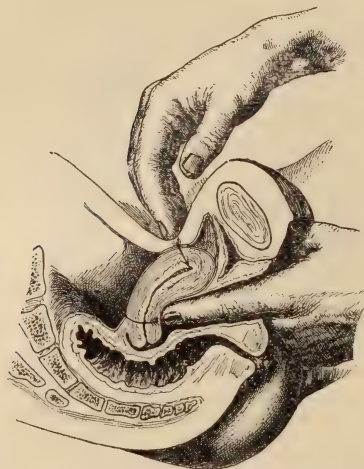


Fig. 6. Bimanual Replacement. This indicates the method of taking the backward flexion out of the uterus, by bending it firmly forward over the index finger. (Kelly.)



Fig. 7. The three pessaries most useful in the treatment of retrodisplacement. A, the Hodge pessary; B, the Smith pessary; C, the Thomas pessary.—(Crossen.)

present in these cases. This important point in operative treatment I have considered at some length in a previous article.*

UTERUS PARTIALLY MOVABLE. The corpus uteri can be raised some distance but can not be brought forward, because of adhesions or infiltration or something that interferes with its complete mobility. In these cases the object of bimanual manipulation is to raise the corpus uteri as far as it will go and then stretch the restraining tissue so it can be raised a little farther.

This *stretching* should be done gently, so as not to tear tissue or cause severe pain. Each movement should be made with the definite object of stretching some restraining tissue, and practically all the movements are made in the direction of reposition, *i. e.*, either raising the fundus and bringing it forward or pushing the cervix backward. In many cases of long-standing backward displacement, the cervix is held forward by shortening and infiltration of the tissues in front of it. This shortening must be overcome, by carrying the cervix far back into the pelvis and thus stretching the shortened tissues. This stretching may be repeated twice a week or once a week or less frequently, depending on the persistence of soreness following. Of course, it should not be employed when there is any active focus of inflammation or a large inflammatory mass, and should not be persisted in when marked reaction follows.

Occasionally, progress may be hastened by *regular pelvic massage*, *i. e.*, fixing and pushing up of the affected tissue with the vaginal fingers while with the abdominal fingers deep sweeping movements are made, compressing the infiltrated tissue from within outward. This tends to improve the circulation of the blood and lymph within the affected tissue and to soften it, and thus aids in the stretching and in diminishing the pain. In some thin patients with a lax abdominal wall, very definite sweeping pressure of the affected tissue against the resistance of the fingers beneath can be carried out, and with evident benefit. In many patients, however, on account of a thick wall or tenderness or tension, the abdominal fingers can not be depressed sufficiently into the pelvis to have any definite compressing effect on the affected tissue, and in all cases this massage is of slight importance compared to the direct stretching of the involved tissues. Of course the term "pelvic massage" includes the stretching as well as the sweeping compression of the tissues, but I prefer to designate the stretching separately and more distinctly, for the term "massage" often carries a very hazy and indefinite idea.

Between the stretching treatments, the patient should take the knee-chest posture twice daily, in order to assist in holding what is gained in the treatments. If desired, a vaginal tampon may be used after each

*The Preferable Method of Anterior Fixation of the Uterus when the Abdomen is Open. The President's Address, St. Louis Obstetrical and Gynecological Society. H. S. Crossen, M. D. Jour. of American Medical Association, Vol. XLVIII., p. 1488.



Fig. 8. Introducing the pessary. First step—depressing the perineum. (Crossen.)



Fig. 9. Introducing the pessary. It is now well within the vagina and ready for turning so that the width of the pessary will lie in the wide diameter of the vagina. (Crossen.)

treatment, to be removed in twenty-four to forty-eight hours, and douches given afterward. When the fundus has been raised far enough to permit the cervix being pushed well back in the pelvis, it is sometimes advantageous to introduce a pessary, even though the fundus uteri has not been brought entirely forward. The pessary thus placed, tends to keep the cervix well back in the pelvis and thus keeps the fundus raised, and also assists the knee-chest posture in bringing the fundus forward.

UTERUS FIXED. When the corpus uteri is so firmly fixed that it can not be appreciably raised by firm pressure at the first examination, there is not much probability of its ever being brought forward by non-operative measures. These cases of fixed uterus may be divided into three classes, as follows:

1. Fixed uterus with inflammatory mass in which operation is required for the inflammatory trouble, and the displacement is a secondary feature.
2. Fixed uterus without a distinct inflammatory mass but with adhesions and troublesome symptoms requiring operation.
3. Fixed uterus without symptoms. As previously mentioned, a case of firmly fixed uterus without symptoms is occasionally met with, and of course requires no treatment for the displacement.

PESSARIES.

FORMS. There are three forms of hard rubber pessary very useful in the office treatment of retrodisplacement, namely, the Hodge pessary, the Smith pessary, and the Thomas pessary. The Hodge pessary (Fig. 7-a) may be taken as the type of the hard rubber ring pessaries and is the original model from which nearly all other pessaries of that character were evolved. It was devised more than fifty years ago by Hugh L. Hodge, Professor of Diseases of Women in the University of Pennsylvania. Albert H. Smith modified the Hodge pessary by narrowing the anterior arm (Fig. 7-b). This allows it to fit well up into the pubic arch, and out of the way, so that it does not interfere with coitus or with the introduction of a douche-nozzle. T. Gaillard Thomas modified the Smith pessary by thickening the posterior end into a bulbous enlargement (Fig. 7-c). This distributes the pressure over a larger surface of the posterior fornix, and in this way tends to prevent pressure injury of the vaginal vault at that point.

ACTION. The action of the pessary is simply to hold the cervix uteri well back in the pelvis, by holding back the posterior vaginal fornix to which the cervix is closely attached. As long as the cervix is held well back in the pelvis, the fundus uteri will, as a rule, stay forward where it belongs.

SELECTION OF PESSARY. Now suppose you have a case of movable retrodisplacement and the uterus has been replaced, what pessary should be used? If there is a fairly good pelvic floor and large posterior vaginal



Fig. 10. Introducing the pessary. The pessary is now turned. It is then pushed in until its further progress is stopped by the cervix. (Crossen.)



Fig. 11. Introducing the pessary. The inner end is against the cervix. The index finger is now passed to the top of the inner end, which is then depressed until it can be pushed past the cervix, as shown in Fig. 12.—(Crossen.)

fornix, use the Thomas pessary. That is the ideal form where conditions are favorable.

As to the size, measure the distance from the posterior vaginal fornix to the pubic arch on the index finger. A pessary of this length will usually fit. A pessary that is too short will not hold the uterus in place, and a pessary that is too long will cause pain, either at once or after some hours. It is advisable to use as large a pessary as can be used without discomfort. To see if it is too large, try to pass the finger around the pessary between it and the vaginal wall.

If there is a narrow, shallow posterior fornix, use the Smith pessary. If there is marked laceration and relaxation of the pelvic floor, use the Hodge pessary, because of the wide anterior end. The steps in the introduction of the pessary are shown in Figs. 8, 9, 10, 11 and 12. The pessary is shown in place in Fig. 13.

DIRECTIONS TO PATIENT. Direct the patient to return in three days, or at any time before that if discomfort appears. If the pessary is comfortable and the uterus in good position at the second visit, the patient is directed to return a week later. If at the third visit the parts are in good position and comfortable, the patient need not return for one month unless there is discomfort. She should return every month or six weeks for removal, cleansing and readjustment of the pessary, to avoid irritating incrustations or persistent pressure at some point causing tenderness. It is well for the patient to take a douche every day or every other day. Coitus is not at all interfered with, provided the anterior end of the pessary lies well up out of the way, as with the Thomas or Smith pessary. In fact, the pessary is sometimes used to overcome sterility due to displacement.

WHEN DISCONTINUE PESSARY. If the uterus stays well in place, I discontinue the pessary after it has been worn about six months. Have the patient return in a week. If no displacement, return again in a month. If the uterus is still in good position the patient may be discharged, to return if symptoms should at any time reappear.

If after the pessary is removed, the uterus tends to go back into retrodisplacement, have the patient take the knee-chest posture twice daily. If this is not sufficient to hold the uterus in place, then reintroduce the pessary.

DIFFICULTIES ENCOUNTERED.

1. *Pessary slips part way out, because of relaxed vaginal opening.*

In such a case use the Hodge pessary, the wide anterior end of which catches at the vaginal opening where the Smith or Thomas will not. In some cases, of course, the laceration is so marked that not even the Hodge pessary will stay in satisfactorily. Here operation is urgently called for. In such a case prolapse is usually the important feature and overshadows the retrodisplacement, and, for temporary relief while the patient is waiting for operation or in an inoperable case, one of the pessaries for pro-

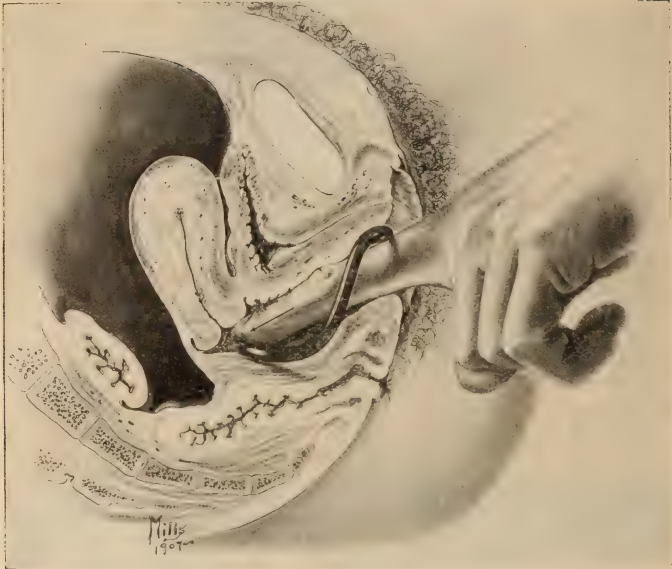


Fig. 12. Introducing the pessary. The posterior end depressed and being pushed past the cervix. (Crossen.)



Fig. 13. The pessary in place. (Skene.)

lapse may be used. I shall not have time to take up the palliative treatment of prolapse to-day, suffice it to say that in the very marked cases of prolapse that will not submit to operation, I have secured much relief by the Gehrung pessary and the Menge pessary—the former as a rule proving the more satisfactory. In fact the Gehrung pessary is the most satisfactory one I have ever used for palliative relief in severe cases of prolapse and of cystocele. In a number of cases where the patient would not submit to operation or was not in condition to permit operation and the uterus stayed outside in spite of other pessaries which were promptly expelled, I have been able, by the use of the Gehrung pessary, to keep the uterus inside so that the patient could live in comfort and attend to her household duties without pelvic distress.

2. *Pessary fails to keep uterus forward.* Use the knee-chest posture as later explained, in combination with the pessary.

3. *Uterus can not be brought entirely forward.* When the fundus can be brought almost forward but not entirely, introduce a pessary and have the patient take the knee-chest posture twice daily and also at any time when pressure symptoms appear. In some cases the uterus is found forward at the next examination. It may be well to mention in passing, that when a patient wearing a pessary returns, always examine to see the position of the uterus before the pessary is disturbed. A finger can be easily introduced through the opening in the pessary and by bimanual examination the uterus may be felt if in anterior position. Then, when the pessary is removed for cleansing, examine again to see if the uterus remains in position with the pessary out.

4. *Pessary causes pain*, by pressure on an inflammatory mass or a painful prolapsed ovary. Such a case requires operation, unless the knee-chest posture gives entire relief, which it seldom does.

5. *Pessary causes nervous discomfort* and persistent pressure sensation, though no decided pain. This persistent nervous discomfort caused by the foreign body in the vagina is very troublesome in certain nervous patients. Such cases are unsuitable for pessary treatment and require operation for permanent correction of the displacement.

INFLATED RING PESSARY. There is another form of pessary that should be mentioned in this connection and that is the inflated ring, shown in Fig. 14-b. The action of the inflated ring is principally to overcome the dragging of the uterus on its supports. It has no particular action in holding the cervix well back in the pelvis nor in maintaining the uterus in a proper forward position. The field of usefulness of this form of pessary is in those cases where the uterus can not be gotten forward or can not be maintained there.

The simple supporting of the uterus, thus overcoming the partial prolapse which is present in most cases of retrodisplacement, often gives the patient much relief, though the displacement has not been corrected. On the other hand, such a pessary is sometimes used by the physician or by the patient on her own responsibility (this form of pessary being



Fig. 14. A, flexible ring pessary; B, inflated ring pessary; C, hard-rubber disk pessary. (Crossen.)



Fig. 15. The knee-chest posture, showing the pelvic structures in outline, and illustrating the gravitation forward of the uterus and adnexa. (Montgomery.)



Fig. 16. The knee-chest posture, with the patient draped, ready for packing or other treatment. (Crossen.)

frequently advertised to the laity), in cases where complete replacement could be easily accomplished. In such a case, complete replacement with subsequent use of the Thomas or Hodge pessary would tend to effect a cure, while the effect of the inflated ring pessary is imperfect and temporary. In the cases where the inflated ring pessary is useful, some radical measures are usually preferable, and the pessary is simply a temporary expedient to make the patient more comfortable while she is getting ready for operation. Some patients, however, prefer to wear the pessary indefinitely, even though it affords only temporary relief, rather than submit to correction of the displacement by operation.

This pessary requires a douche every day and should be removed and cleansed at least every week. It requires more care to prevent incrustation and irritation. The patient can usually remove and reintroduce the pessary herself after a little practice. A hard rubber disc of the same form, shown in Fig. 14-c, may be used, and is not so likely to accumulate incrustation and irritate the vaginal wall. It is unyielding, however, and for that reason is likely to cause painful pressure at some point. A somewhat different form of soft rubber ring pessary, used in the same way, is the flexible rubber ring shown in Fig. 14-a.

KNEE-CHEST POSTURE.

This is one of the most useful measures in the treatment of uterine displacement. The patient supports herself on the knees and chest (Fig. 15). The clothing must be well loosened about the abdomen. The head rests on a pillow with the face turned to one side. The elbows should be spread apart so that the breasts come against the table or bed. The thighs should be perpendicular. Unless care is taken to call the patient's attention to this point, she is likely to have the knees too far forward or too far backward, and thus a part of the possible elevation of the hips is lost. The patient is arranged in this posture in the office, to show her how, and in some cases for packing or replacement of the uterus as previously mentioned, and then she is directed to take the posture at home twice daily. As the clothing must be well loosened, usually the most convenient time is while the patient is in bed, just after retiring in the evening and just before rising in the morning. The posture is to be maintained one or two minutes, and it is well for the patient to make several deep respiratory efforts.

The effect of this posture is to temporarily take all pressure from above off the pelvic organs and permit them to gravitate toward the abdominal cavity (Fig. 15). The downward pressure is for the time being removed, the local circulation is greatly improved, and a movable retro-displaced fundus uteri tends to gravitate forward toward the normal position. In the office, this effect may be much increased if a Sims speculum be introduced into the vagina so that air may enter. Further assistance toward replacement of the uterus may be rendered by catching the cervix with a tenaculum-forceps (after the Sims speculum is intro-

duced and the cervix exposed) and pulling the cervix toward the vaginal entrance, so that the fundus can swing clear of the sacral promontory. Then carry the cervix well back in the pelvis by the attached tenaculum-forceps. This aids in bringing the fundus well forward. If desired, a tamponade or pessary may be put in, to keep the cervix well back in the pelvis. Fig. 16 shows the patient in the knee-chest posture and covered with sheet which is arranged to permit of treatment.

CASES FOR KNEE-CHEST POSTURE. 1. Where the uterus can not be brought forward, because of thick abdominal wall or resistance or pelvic tenderness or probable adhesions.

2. In neurotic women where the displacement is sometimes of secondary importance, and it is desired to secure as much replacement as possible without directing the patient's attention to the pelvis particularly or repeatedly. Here it may be used simply as part of a course of exercise without the patient knowing that any effect on the pelvic organs is intended.

3. In pregnancy, where direct pressure on the displaced uterus should be limited because of the danger of miscarriage.

4. In virgins, where local treatment and pessaries are to be avoided as far as possible.

5. In cases where the uterus returns to the backward position occasionally with the pessary in place or does not stay as far forward as desired.

6. In cases where the pessary has been removed and the uterus shows a tendency to return to its old position of retrodisplacement.

SELECTION OF CASES

FOR OFFICE TREATMENT.

Success in the office treatment of retrodisplacement depends to a considerable extent on the proper selection of cases. The cases suitable for this treatment have been mentioned in speaking of what can be accomplished by the various therapeutic measures employed therein. To complete the subject it is only necessary here to call attention to the classes of cases which are *not* suitable for this treatment.

1. Cases in which there is a tender inflammatory mass fixing the uterus. When the inflammatory trouble is acute, palliative treatment should be directed toward relieving the inflammation and no attempt should be made to correct the displacement until the inflammation has subsided. An attempt at replacement in the presence of acute or subacute inflammation, only aggravates the inflammation without improving the position of the uterus.

When the inflammatory focus is a chronic one, operation is required, to remove the inflammatory trouble and make permanent correction of the displacement.

2. Cases in which the uterus will not come forward sufficiently, or

will not stay forward with the use of the pessary sufficiently, to relieve the symptoms. When the non-operative measures fail to give satisfactory relief, then the case is one for operation.

3. Cases in which a painful prolapsed ovary, on one or both sides, gives trouble in spite of the palliative measures. In such a case the abdomen should be opened, any inflammatory lesion of tube or ovary appropriately treated, and then the uterus fastened forward by a method that will elevate the prolapsed adnexa as well as the uterus itself.

4. Cases in which the pessary causes persistent pressure discomfort and nervous annoyance. A well-fitting pessary should cause no discomfort. Its presence should not be appreciable to the patient after the first day or two. When it does cause persistent discomfort, the case is not one for pessary treatment, but for operative treatment, provided the symptoms are of sufficient severity to warrant the same.

5. Cases of displaced uterus without symptoms. These are infrequent, but are found occasionally, under three conditions, as follows: (a) small senile uterus (may be movable or fixed), (b) firmly fixed uterus in child-bearing period (no downward dragging), and (c) small virgin uterus (may be movable or fixed). In these exceptional cases where there are no symptoms from the displacement, no treatment for the same is required.

6. Complicated cases. In many cases of movable displacement there are complications which require attention and which makes it preferable to employ operative treatment that will reach both conditions, rather than palliative treatment for the displacement.

It will be inferred from consideration of the above mentioned classes in which office treatment does not give sufficient relief, that operative treatment is required in the majority of cases, and such proves to be the fact in actual practice. Of the patients sent to me for retrodisplacement, in by far the larger proportion, operation is indicated without question. In a considerable proportion of the remaining cases, a trial of non-operative measures shows that they are inadequate, and then operation is employed. Hence, it is only in a small proportion of cases of retrodisplacement that office treatment is found to be wholly satisfactory. But in that small proportion of cases it is the preferable treatment, either because it gives complete relief and thus obviates operation, or because it gives partial relief where operation is impossible for the reason that the patient refuses operation or is not in physical condition for it.

REMARKS ON TUMORS OF THE PAROTID GLAND.

By FRANCIS REDER, M. D., of St. Louis.

My reason for presenting this paper must be attributed to the refusal of a patient to have a tumor of the parotid gland removed, because the promise could not be made that no facial paralysis would result from the operative intervention.

When we consider what an interesting array of anatomical structures are centered about the parotid gland, it is very important that the strongest anatomical reasoning be exercised in case of disease where operative measures might be indicated.

An anatomical thought recalls to us that the parotid gland lies on the ramus of the lower jaw, passing deeply behind it, between it and the mastoid process. The external carotid artery, with its great terminal branches, together with the veins which accompany them, the facial nerve and its important divisions, with branches from the cervical plexus, are imbedded in it, while the internal carotid and internal jugular, the spinal accessory, glossopharyngeal and vagus nerves, lie close to its deep surface. The gland is inclosed, excepting its pharyngeal surface, in a strong fibrous sheath. Its duct, which is a resistant, fibrous tube lined with mucous membrane, opens within the cheek opposite the second molar tooth of the upper jaw. Cellular tissue and muscle lie over, or superficial to the parotid, so that it is firmly bound down and covered on its outer aspect. The deep or pharyngeal surface suffers a deficiency of a capsular investment. This has an important bearing on the direction taken by pus when found deeply within the gland and by cancerous growths in their extension. A tumor of the parotid gland may be of a simple or a malignant kind. I may state here that all growths of the parotid gland can be regarded with a strong suspicion, no matter what their character, the most innocent often harboring a feeble malignancy.

This has been explained on the ground that sarcomatous elements, together with glandular, fibrous, mucous and cartilaginous structures have been demonstrated in them. Such growths are known as the mixed parotid tumors. They are met with in both sexes, most frequently between the ages of 17 and 35 years. The presence of cartilage in a parotid tumor, a so-called chondroma, must be explained upon the principle advanced by Lücke and Cohnheim. The cartilage of the first bronchial arch lies at the site of the subsequently developed parotid and fetal cartilaginous structure is enclosed during the formation of the gland.

The common parotid tumor is perhaps the growth with which the surgeon is best acquainted. It is usually fibrous, or glandular for the

most part, but has mixed with it cartilaginous masses and often cysts. This tumor at times invites difficulty as to its differentiation from a diseased condition of the lymphatic glands lying over and in the parotid. A tumor of these lymphatics can be and has been mistaken for the organ itself, the extirpation giving the belief that the parotid gland was being excised.

A common parotid tumor can, by compressing the parotid gland more or less, occasion atrophy and almost total absorption, so that when it is removed a deceptive appearance is produced of the parotid having been excised. Simple parotid tumors are hard, deeply attached, but movable on careful manipulation. They may attain a large size. Their surface is irregular and usually well-rounded in appearance. The skin covering them is thin, but not adherent and not infrequently a network of veins covers the mass. These growths lie below, in front of and behind the ear, and grow slowly. Sometimes they remain stationary for years.

In exceptional cases the inoperability of such tumors is manifested by the firmness with which they are bound down by prolongations sent under the ramus of the lower jaw, filling in the space between the angle of the jaw and the mastoid process. It is then when they involve the blood vessels and nerves of this important region, coming into relation with the styloid process and its muscles, with the internal as well as the external carotid, and even pressing upon the pharynx and projecting into the fauces.

As a rule, the common parotid tumor, when of ordinary size, has little or no effect upon the general health, and only in exceptional cases causes facial paralysis by pressure.

The tumors which infiltrate the gland substance, give the surgeon his greatest concern. They are the malignant growths and are usually spheroidal cell carcinomata. Clinically, in malignancy the evidence of the physical characteristics of the growth is so clearly portrayed at a comparatively early state, that a diagnosis can be made without the loss of valuable time. We have, for instance, the rapid growth of the tumor, hard or soft, ill-defined and early fixed, usually growing under the ear in persons at or after middle life. With this growth there is associated a pain that is often excruciating, flashing up to the temple and down the side of the neck.

In the rapid growth of a malignant tumor the skin becomes involved early. The virulent infiltration makes it coarse and dark colored, giving it a leathery appearance,—the “squirrhe en plaque” of the French. Its tendency is to spread towards the neck and the region of the mastoid process. This form of schirrus resembles the *cancer en cuirasse* of the mammary gland in all its clinical characteristics.

A different clinical picture can be found in the “squirrhe atrophique.” Here we have a depression at the site of the carcinomatous growth, the skin being thrown into small folds which radiate toward the outer margin of this depression.

In the "squirrhe-en plaque" the skin in time gives way, causing a broad-spreading, deep, characteristic, bleeding ulcer, with a hardened chain of glands and dilated veins, with facial paralysis and early embarrassment of deglutition and mastication.

In the "squirrhe atrophique," facial paralysis is an early sign and is caused by the massive contraction and compression of the connective tissue element at an early state of the malignant action.

The sarcoma of the parotid is a more common affection than the carcinoma. This is most likely caused by the sarcomatous elements that enter so freely into the formation of the so-called mixed parotid tumors, looked upon as innocent, but in reality feebly malignant, which later on present themselves as malignant growths. The differentiation between sarcoma and carcinoma must be made with the aid of the microscope to be acceptable as a positive diagnosis. As a rule, a sarcoma does not exert as much pressure, nor does it involve and destroy the skin as does a carcinoma. It may, however, show a more marked local malignancy, which accounts for the frequency with which such growths return after excision. Now I wish to speak of the excision of parotid tumors, the part of the disease which is of the greatest interest to the patient.

In venturing an opinion on a parotid growth, it is very necessary that the physical characteristics of the tumor be specifically determined, so that any future embarrassment may be spared the surgeon, should he decide to operate. In many cases the operation is not difficult, though the size and appearance of the tumor may cause it to appear very formidable. Mere size is no contraindication to an operation, for very often the bulk is due to the increase of the tumor being solely in an outward direction. It is when there are deep and irregular prolongations of the growth, when it grows within the capsule of the parotid and when the prolongations have formed close connections with the blood vessels and nerves behind and below the angle of the jaw, that no operation can be more difficult and dangerous.

Other conditions that will influence the judgment in determining for or against an operation are the mobility and circumscription of the growth; the possibility of inserting the fingers below it, as it were, raising it up; the freedom from pressure-effects on blood vessels and nerves; the healthy state of the skin and the lymphatic glands; the rate and direction of the tumor's increase, the age and state of health of the patient, and the possibility of removing the whole mass.

The removal of simple growths is usually readily accomplished without much damage to the facial nerve. It is very desirable that the greatest care be exercised when working in the neighborhood of this important structure. If by some unfortunate stroke of the knife or nip with the scissors, this nerve should be seriously injured, the unpleasant echo will continue to resound long after the tumor matter has been forgotten. Two conditions are really imperative in the removal of simple growths:

One, the capsule, should be completely removed with the tumor mass.

If the capsule cannot be removed with the growth, it is to be excised as thoroughly as is practicable with the least amount of injury to the gland substance proper. This is a procedure, however, which under the most careful dissection has in the majority of my cases given me considerable annoyance, on account of the fistulous condition created by wounding the minute ducts of the small lobules of the gland during the dissection. Usually from three weeks to three months, under careful attention and consoling utterances to the patient, is the time for such a fistulous condition to subside. For this reason, after the overlying parts have been freely divided down to the tumor, the dissection of the mass should be principally a gauze dissection, only the stronger attachments being severed close to the tumor with the scissors.

The other condition is that of preserving the facial nerve. It would seem better for the peace of the surgeon not to undertake the extirpation at all in an ordinary parotid tumor, should he feel doubtful as to the preservation of this important structure. No promises can be made and should not be made to the patient; it is eminently more satisfactory and safe to tell the patient in a very guarded manner what might and might not happen.

Malignant growths, on the other hand, when subjected to operation, peremptorily invite the sacrifice of any and all structures coming within the operative field, for it is here that an operation, unless carried out most radically, is worse than useless.

The incision influences greatly the working facility of the operator. It is absolutely necessary that a free exposure of the tumor be made. The incision usually passes down the posterior surface of the tumor, a so-called vertical incision lying over the large vessels, and another, a transverse incision, exposing the facial part of the growth. Such an incision meets the requirements for the excision of the ordinary sized tumors. The tumor is best detached from below and behind, upward and forward. By following this part of the technique, the main blood-vessels which are necessarily cut can be secured, obviating the tying of these same vessels again and again in the course of the operation. It has been found comparatively easy to compress and tie the external carotid as it enters the tumor.

It is in dealing with the back of the growth that difficulties chiefly arise. The traumatism to structures that must be evaded can be minimized by keeping close to the tumor, avoiding cutting during the dissection as much as possible. Drainage must be very carefully provided for and no skin removed unless it be diseased.

The question of subjecting a patient suffering with a malignant disease of the parotid to an operation is a very serious one. I have not yet been assured from what I have seen of this work that the good which apparently results, justifies the operative measure. I am rather inclined to deal with such conditions as I would with a malignant disease of the prostate gland,—advise against operation. However, the wish of the

patient must be considered, irrespective of what the surgeon may entertain after a careful examination of the tumor. Through a piece of good fortune it may happen that the structural involvement may be such that an operation might prove of much benefit to the patient, and bring the greatly sought mental relief to him. However, this is the sympathetic side of the question and rather out of place here.

The question of hemorrhage will tax the surgeon to his utmost. I will enumerate the principal vessels that come under the knife in a total extirpation of the parotid: Veins, right jugular, anterior and post facial; arteries: transverse facial, auricular post, occipital, superficial temporal, anterior auricular, orbitalis zygomatic, interior maxillary and the external carotid. Most of these vessels are liable to be much enlarged and numerous anastomoses are usually present.

In the face of such a vascular array, it would be tempting to ligate the common carotid as a preliminary procedure, so that the question of hemorrhage might be reduced to the satisfaction of the surgeon. With the ligation of this important vessel, there is of course always the great risk of exposing your patient eventually to brain mischief. This risk, however, is not to be compared to the risk the patient is exposed to on the operating table when a soft and extensively infiltrated parotid gland is to be removed.

Roux suggested a temporary ligation of the common carotid by passing a loop of chromic catgut ligature around the vessel, loosely tied, entrusting it to an assistant who keeps up tension on the ligature whenever bleeding takes place. Jacobson, whose extensive experience with this class of tumors has made his word authoritative, prefers the ligation of the external carotid with all the accessible branches. It has always answered the purpose to his satisfaction.

To excise a sound unchanged parotid, and one affected with cancer, are very different things. The former can be accomplished with ease, the latter, however, demands experience and mature knowledge in the surgeon who undertakes it.

TWO RARE OPHTHALMIC CASES.

By JAMES MOORES BALL, M. D., of St. Louis.

CASE I. *Hydrophthalmos, Trauma, Dislocation of the Eyeball.* In 1900 a little girl with hydrophthalmos of both eyes was brought to my clinic. The history obtained at the time was as follows: At birth her eyes seemed to be normal. Two or three days later she developed a purulent conjunctivitis. She was treated by a well-known oculist. Her eyes gradually enlarged and vision was lost, except for light perception in the left eye.

Five years later, namely, July 29, 1905, this child was again brought to me. On the afternoon of this day, while playing alone, she stooped



Fig. 1. Front view.

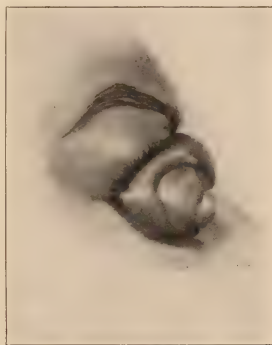


Fig. 2. Profile.

and struck her right eye on a projecting knob of a chair. The mother states that immediately after the accident the eye did not present any unusual appearance. One hour later, however, the eyeball was dislocated, as is shown in the accompanying illustrations. Immediately after the injury she had pain in this eye, which continued for an hour,—the mother says, “until after the eye gradually worked out.” I saw her at five o’clock, four and one-half hours after the injury. After a photograph had been made by electric light, the child was chloroformed, the eyelids were separated with retractors, and the eyeball was gently replaced. A silk suture was passed through the outer third of both lids and a compress bandage was applied. On August 10th, the stitch was removed. During this period considerable fluid ran from

the eye. One year later, my records show that only a small stump remained to mark the site of what had been a hydrophthalmic globe.

Early in September, 1908, this patient was again brought to me. Her age is now thirteen years. The left eye has become enormously enlarged. It protrudes beyond the eyelids and is often severely painful. She is totally blind.

On September 12, 1908, I enucleated the eye. The operation was done with great care lest the eyeball rupture. The globe was delivered with difficulty, but without mutilation of the eyelids. After having been hardened the globe was bisected. It measured 45 mm. in the antero-posterior diameter, and 30 mm. transversely. The diameter at the base of the cornea was 28 mm. It was larger than any other hydrophthalmic eye of which I have been able to obtain an account in the literature.

The influence which the presence of the eyeball has upon the growth of the orbit is shown in this patient, the right orbit being smaller than the left one.

Undoubtedly the injury to the right eye produced a rupture of the sclera—a fact which accounts for the disappearance of the enlarged eye after it had been replaced in the orbit.

CASE II. *Flat Sarcoma of the Chorioid*. D. M., male, aged fourteen years, was brought to me in October, 1908. The present trouble began about four months previously. Vision of the right eye has been lost for several weeks. Examination showed an ordinary picture of absolute glaucoma. Tension was plus 2. Owing to opacities in the lens, the ophthalmoscope could not be used with satisfaction. Diagnosis: Secondary glaucoma. Enucleation was advised, and was made on October 13, 1908. After hardening, the eye was bisected. The specimen shows a flat, whitish, jelly-like, elastic mass, situated between the retina and sclera. The retina is detached from the optic nerve to the ora serrata.

Microscopic examination by Dr. C. A. Vosburgh shows a small round-cell sarcoma of the chorioid.

The interesting feature of this case is the shape of the new growth. According to Parsons, flat, diffuse, or infiltrating sarcoma of the uveal tract is extremely rare. In 1905, Parsons¹ was able to collect only 31 cases from the literature. The term "ring sarcoma" has been applied by Ewetsky to those sarcomas of the chorioid which involve also the ciliary body and iris.

¹Parsons: Pathology of the Eye. New York and London, 1905. Page 529.

HABITUAL OR RECURRENT DISLOCATION OF THE PATELLA.*

By ALEXANDER EARLE HORWITZ, A. M., M. D., of St. Louis, Mo.

By this term we mean frequent dislocation of the patella following a traumatic, or, more rarely, a pathological, dislocation. It was first described by Malgaigne in 1836, and is by him claimed to constitute one per cent. of all dislocations. In respect to etiology three varieties may be mentioned, congenital, traumatic and pathological. The causes for the congenital form must be looked for in the domain of congenital deformities, or more especially in that class to which dislocations belong. It will thus be placed in a class by itself. The pathological conditions causing a dislocation may be disease of the joint, muscles or ligaments. Any condition producing a relaxation of the capsular ligaments, will predispose to dislocation. The third group, traumatic, is by far the largest and most important. Various forms of injury may be enumerated: a slight twisting of the body as in golf playing, a fall, or a blow. A soldier in presenting arms is reported to have dislocated this bone. In the case I am about to report, a fall during an epileptic seizure caused the first dislocation, which was repeated at every subsequent seizure.

The dislocation is, as a rule, to the outer side, the inner dislocation being more rare. Various factors enter into this condition. In nearly all of these cases a genu valgum exists. In the pathological condition we have a laxity of the external capsular ligaments, an outward rotation of the tibia and a slight external displacement of the patella. The questions of the coexistence of the genu valgum and luxation of the patella, and the influence one bears upon the other, have long been decided in favor of the former. Another factor is the altered external condyle. It is usually found to be flattened and permits the patella to glide over it. The action of the quadriceps is another factor. The line of action of this muscle in the axis of the thigh differs from that of the patella ligament in the axis of the leg. The quadriceps, in contracting, pulls the patella outward in order to form a straight line of the muscle and ligament. Normally, dislocation is resisted by the outer margin of the trochlear surface of the femur, which is higher in its upper and anterior surface, than the same ridge at the inner side. With this ridge lacking, the patella may be pulled outward. Goldthwait, in this connection, says: "If for any reason the line of pull becomes less direct or the articular ridge less perfectly formed; if the capsula be weakened by the distention following

*Read before the Alumni Association of the Washington University Medical Department, December 15, 1909.

some acute injury; if the patella tendon be abnormally long so that the patella is drawn above the outer edge of the trochlear surface of the femur; or if the joint can be hyperextended so that during the muscular pull the patella is lifted away from the femur—in any one of these conditions the stability of the joint, so far as the patella is concerned, must be naturally lessened."

In genu valgum, when existing, a stretching of the internal capsular ligament as well as a stretching and consequent weakening of the fibers of the vastus internus take place. The balance of power between the vastus internus and externus is thereby disturbed, and the latter, exerting greater force upon the patella than the former, draws the patella toward the external condyle. The constant impingement of the patella against the external condylar ridge tends gradually to erode this ridge and flatten the condyle. We now have all the factors suitable for a dislocation. If upon this some external factor, such as trauma, be imposed, the inevitable will result—the patella is pulled over the condyle and to its external side. The flattening of the external condyle, found in all these cases, may thus be secondary to a pre-existing weakness of the vastus internus, and a predisposing cause to the patellar luxation.

The tubercle of the tibia is frequently noted to be displaced outwards. Wolf's law, that bones conform in their shape to their usage and function, would account for this in the congenital cases. There is a probability that undue tension of the vastus externus is, in these cases, already exerted in utero, displacing the tubercle outwards, causing a disturbance in the components of the quadriceps, and a predisposition to dislocation of the patella in later life.

In some cases a slight hyperextension of the knee is noted. Where this exists a dislocation of the patella is rendered extremely favorable. The mechanism of the dislocation is stated thus by Voielmier: The knee being in extension or hyperextension, the patella reposes upon the superior and external part of the femoral trochlea, because the cartilaginous surface of the trochlea is higher externally than the internal. A blow upon the knee from within outward easily reaches the internal border of the patella, which rises in this attitude above the anterior surface of the femur, and the patella is projected outside of the external condyle, since the crest which limits the cartilaginous surface of this condyle is not high enough to offer serious resistance. At this moment the patella passes to the outside of the external condyle, flexion of the knee takes place, the patella glides to the outer side of the femur, and remains fixed. The only structure which offers resistance is the internal ligament, and this is usually torn.

These traumatic dislocations are as a rule at first easily reducible, but gradually increase in frequency, and finally remain chronic and irreducible. My patient was at first able to replace the bone herself, but for the past year this was impossible. The symptoms are less severe the oftener the dislocation takes place, but more severe than in the congenital form. In

this altered position the quadriceps is unable to extend the limb and locomotion becomes very difficult. The tibia is rotated outward, and knee slightly flexed. The intercondylar fossa can be seen and palpated, the patella is to the outer side of the external condyle, and inner condyle is prominent. Atrophy of the vastus internus results. The flexors are contracted. In case of long standing ankylosis between the under surface of the patella and the external condyle takes place. There is as a rule little pain, and no fluid within the joint.

If complete lateral dislocation occurs in childhood, the condyles conform in their development to the limited range of motion, and complete extension is then impossible, due, according to Goldthwait, not to ligamentous or tendinous contracture, but to a change in the articular planes.

Amelia Chisholm, age 26, mulatto, small child at birth. At age of one month had a "crying spell" lasting a month. Had convulsions when teething. Had no diseases of childhood (unreliable). Both grandmothers died of paralytic stroke (father half white). Had five brothers and sisters; one died of heart disease at age of six. Spells came on at age of fifteen. Comes on at infrequent intervals, sometimes two or three a night, again two or three days apart. Since the first attack patient has complained of pain in left leg. Four years ago left patella become dislocated; could replace it, but was again dislocated with each attack (probably due to a fall). Right knee occasionally becomes displaced. (It has not been so during the entire time patient was under observation at the hospital.) For about past year, knee and leg were very painful, and walking was almost impossible. Had no power to extend leg.

P. E. Fairly well nourished mulatto. Left knee: Patella to outer side of leg, inner edge 3 cm. from a line drawn from tibial tubercle, with knee extended, to center of thigh, and 3cm. higher than right patella. Cannot extend knee voluntarily. Inner condyle thickened and enlarged, moderate knock-knee exists.

Right knee, over patella,	31	cm.;	left, 33	cm.
Right knee, below patella,	29	cm.;	left, 29	cm.
Right knee, above patella,	28½	cm.;	left, 27½	cm.

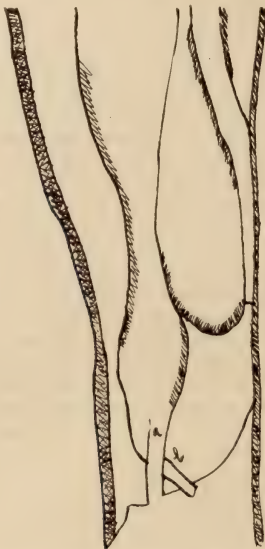
Operation July 19th, 1909.

Incision in median line over knee 3 in. long from below tubercle of tibia upward. Ligamentum patellæ laid bare, incised longitudinally through its entire length, outer half separated from tibial tubercle, carried under inner half, and attached to the periosteum at the inner side of the anterior surface of the tibia. A fold was made in the inner capsule by means of catgut. The capsule was not opened. The patella was brought to the median line. Limb put in plaster of Paris for six weeks, and passive motion begun about two weeks later.

December 1, 1909. Patient can walk comfortably. Can extend leg voluntarily. Patella occupies intercondylar space. Patient has had numerous seizures since operation, but no dislocation of the patella has

resulted. The femur is rotated inward, tibia outward. When leg is extended outward rotation of the tibia is increased.

The point of insertion of the freed half of the tendon was made at a lower level than the tubercle, so as to draw the patella down and tilt it. Various operations have been introduced to relieve this condition. Huebschar enumerates a list of thirty-five varieties. Among these are removal of the patella; chiseling a trough in the trochlea in which the patella is placed; correction of genu valgum; irritation of external condyle to produce an exostosis and barrier to further dislocation; osteo-



a. Outer half of patellar tendon, detached from tubercle of tibia, carried under inner half of tendon and attached to periosteum and expansion of sartorius. b. Inner half of patellar tendon, left intact. (After Goldthwait.)

tomy of external condyle, and lower fragment brought forward. This prevents dislocation and prevents quadriceps from gliding externally; transplantation of the tibial tubercle inward; excision of inner capsule; tenotomy of ligamentum patellæ; transplantation of outer half of ligament.

This latter operation, devised by Goldthwait, is very rational. He tried transplanting the tubercle with its attached ligament, but with poor success. He then left the tubercle in its place and freed the outer half of the ligament from its attachment, and brought it to the inner side of the tibia, attaching it to the periosteum and aponeurosis of the sartorius.

"In performing the operation, the inner half of the tendon, or that most favorably situated for the direct muscular pull, is entirely undisturbed, so that in case the transplanted portion fails to unite, function is still possible, and some improvement must result, as the simple removal of the outer half of the tendon practically moves the existing attachment of the tendon farther to the inside." Goldthwait further states that carrying the free portion under the other is of importance, as in this way the patella is tilted, the outer portion being drawn downwards, and impinges more firmly against the outer ridge of the articular surface of the femur during the muscular contraction, so that the danger of displacement is materially lessened.

The causes therefore leading to this deformity are: 1. Genu valgum. 2. Flattening of external condyle. 3. Change of axis of quadriceps to leg and that of patellar ligament to leg with increase of intervening angle. 4. Rupture of internal lateral ligament.

The direct causes are, external violence or sudden contraction of the gastrocnemius.

The operation of choice is that performed in our case.

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MEDICAL AND SURGICAL PROGRESS.

ARTHRITIS DEFORMANS.

A REVIEW OF RECENT LITERATURE.

By NATHANIEL ALLISON, M. D.

1. RHEUMATOID ARTHRITIS AND ITS TREATMENT.—Murrell (*Med. Press and Circular*, December, 1908).
2. ARTHRITIS DEFORMANS.—Tubby (*Lancet*, December, 1908).
3. CHRONIC RHEUMATOID POLYARTHRITIS.—Kauffmann (*Brit. Jour. of Children's Diseases*, May, 1909).
4. RHEUMATOID ARTHRITIS AND SCARLATINAL RHEUMATISM.—Poynton (*Quart. Jour. of Medicine*, 1909).
5. RHEUMATOID ARTHRITIS, ITS CLINICAL ASPECTS, DIAGNOSES AND TREATMENT.—Dent (*Practitioner*, October, 1909).
6. ARTHRITIS DEFORMANS.—Nichols and Richardson (*Jour. of Medical Research*, September, 1909).

Murrell classifies rheumatoid arthritis as follows: (1) The chronic arthritis of middle aged women; (2) acute rheumatoid arthritis; (3) senile osteoarthritis; and (4) various forms of the disease in children. He believes that the prognosis, as far as cure is concerned, is unfavorable, and recommends the following well-established therapeutic agents: Iodids internally, also arsenic; locally, the application of iodine, warm baths, and hot and cold salt douches. These patients should live in a hot, dry, bracing climate. Cases in the hospital have responded to serum therapy in an admirable way. The treatment by this serum therapy is given in an article by the same author in *Encyclopedia-Medica*, Vol. 12, 1909.

Tubby divides the clinical material represented under the name of arthritis deformans into the following classes: Still's disease, hypertrophic arthritis deformans, and atrophic arthritis. He goes over the ordinary therapeutic measures at our disposal, such as guaiacol, carbonate, iodid, etc., and says that local treatment by radiant heat, vibration and hot air baths, is useful. The surgical measures which he recommends are of especial interest. He does not believe that these joints should be fixed, but he is in favor of supporting them. Tender and painful joints are relieved by compression bandages. Operative interference may accomplish definite good and reduce the inflammatory processes in all the joints where only one has been treated. The explanation of this is that the articulation is freed of either bacteria or toxins. The removal of hypertrophied villi and osteophytes results in improvement. The establishment of deformity should be prevented, and where deformity exists it should be corrected by surgical procedure.

Kauffmann has reported the case of a girl of eight years in whom there was enlargement of all the joints in the body. This enlargement took on a fusiform shape and was not accompanied by pain, or tenderness, or grating. All the joints could be moved, except the right hip-joint, which was ankylosed by an osteophytic growth. The muscles were extremely atrophied, the spleen was enlarged and all the lymph glands over the body were palpable, but not tender. Tuberculin reaction was twice negative, and the temperature reached from 90 to 101 degrees. This child had three attacks of pneumonia, at the ages of one, two and three years, and measles at four years. In the sixth year, the joints began to enlarge and the muscles to waste which condition has steadily progressed. Kauffmann suggests that, perhaps, pneumonia was the etiological factor in this case of rheumatoid arthritis.

Poynton has traced the history of 25 cases of rheumatism in childhood which had been directly associated with scarlet fever. In one case, which was fatal from pericarditis, a bacterium was found which showed a character similar to the diplococcus found by Poynton and Paine in acute rheumatism. He believes that the port of entrance in the two diseases is the same, and that children who have had rheumatism during or after scarlet fever, are liable to relapse into multiple arthritis, chorea, or heart disease. He believes that salicylates benefit the condition and makes a distinction between scarlatinal and rheumatoid arthritis. He is also of the opinion that a more thorough bacteriological investigation will show a close relationship between the streptococcus of scarlet fever and the micrococcus rheumaticus.

Dent selects the name rheumatoid arthritis as being the proper one for describing a progressive degeneration of joints of a special kind, accompanied by atrophy of some structure and hypertrophy of others. It is really only a name given to a number of conditions, the cause of which is unknown. It is probable, he thinks, that more than one disease may account for the different types of so-called rheumatoid arthritis. The course of the disease is variable but tends usually towards irrevocable damage to the structures involved. He classifies it as follows: Polyarticular rheumatoid arthritis, which may be acute, subacute or chronic; and localised monarticular, or senile, rheumatoid arthritis. He believes that massage, electricity, radiant heat, baths and serum treatment, all work for improvement in certain cases. Depressing drugs should be avoided and that guaiacol carbonate apparently does some good. Treatment by passive congestion will often relieve pain. He also states that such measures as excision, scraping of joint tissue, or merely a washing-out of the joint, in acute stages, have arrested the spread of disease, not only in the joint operated upon but in other joints similarly affected.

The work of Nicholas and Richardson is deserving of especial attention. These writers have been engaged in the study of the pathological condition in joint cases for a period of eight years. Although the time seems long it was necessary that observations cover such a period on account of the difficulty of obtaining material, since these cases are essentially chronic and persist for years, being fatal only from the existence of intercurrent disease. The objects of their study were, primarily, to determine the actual lesion or lesions, present in these joints, the relation of the lesions to clinical symptoms, and incidentally the study of the etiology. They have discovered two pathological groups: (1) Those which arise from primary proliferative changes in the joints,—chiefly in the synovial membrane and in the perichondrium; (2) those which arise primarily as a degeneration of the joint cartilage.

Their work is illustrated with beautiful colored plates and is most gratifying in its thoroughness.

As to prognosis, they make the following statement: In advanced cases the prognosis can never be favorable. The situation, however, is somewhat different in the early stages. Here, if the cause can be removed, the outlook is more favorable, and it is true that in some of the patients excellent results are obtained. It should be remembered, however, that both types of this disease tend to progress intermittently, and that sometimes the intervals between the acute attacks are long. Consequently, it behooves the surgeon to be wary and not to count as a cure cases in which the period of relief represents only a remission. It is undoubtedly true that some of the cases, notably those of the proliferative type, progress rapidly and lead to dreadful suffering and deformity, in spite of intelligent and careful treatment. Summing up their article they reached the following conclusions:

1. In non-tubercular deforming arthritis there are two pathological types of joint changes: (1) the proliferative type, which tends to destroy joint cartilage, and lead to ankylosis of adjacent joint surfaces; and (2) the degenerative type, which tends to destroy the joint cartilage, and produce deformity without ankylosis.

2. These two types do not correspond to two definite diseases, but each type represents reaction of the joint tissues to a considerable variety of causes.

3. In neither type, if the original injury is sufficiently severe, or if the causative factor continues to act, is there likelihood of the regeneration of a perfect joint.

4. A joint injury of a sufficient degree, even if the primary cause ceases to act, may of itself continue to act in a vicious circle as a cause of continued joint change.

5. Clinically the aim should be to recognize the type and stage of the lesion present, and then to determine and remove the active cause.

6. The prognosis should be guarded because of the difficulty in determining the active cause, because of the unlikelihood of complete regeneration of a severely injured joint, and because of the known clinical history of many of the cases.

7. The nomenclature used in this article is suggested because it described the pathological process without any assumption that the etiology is known in any given case.

8. Future advance in the study of these processes may be expected from a study of their etiology.

VACCINE THERAPY IN OTOLOGY.

A REVIEW OF RECENT LITERATURE.

By WM. B. CHAMBERLIN, M. D.

1. Beck.—*Laryngoscope*, May, 1908, pp. 187-193.
2. Beck.—*Transactions American Laryngological, Rhinological and Otological Society*, 1908, pp. 459-465.
3. Jacobs.—*Cleveland Medical Journal*, to appear February, 1910.
4. Magruder.—*Laryngoscope*, November, 1907, pp. 879-882.
5. Tod.—*Practitioner*, May, 1908.

There is an abundance of recent literature upon the various phases of vaccine therapy, its theory, technique and the results from its clinical application. Notwithstanding this general literature, both theoretical and clinical, but little has appeared concerning the use of vaccine therapy in the treatment of diseases of the upper respiratory tract—still less concerning its use in otology. This scanty literature we feel sure is not to be taken as an indication that little or no work is being done by otologists and laryngologists along these lines but may rather be ascribed to one of two causes—either the feeling that sufficient time has hardly elapsed since the use of vaccine therapy was introduced to feel confident of results and a consequent hesitancy to report cases, or a general laxity in reporting interesting cases; the latter being a fault to which many good observers are liable. If it is in the hope of stimulating some interest along the lines of vaccine therapy that the present review seems warranted.

The theory of vaccine therapy is almost too well known to necessitate repetition. Beck, in his articles published in the *Laryngoscope* and in the *Transactions of the American Laryngological, Rhinological and Otological Society*, states it very tersely in the following terms:

I. Bacteria infecting the body are attacked by leucocytes, which ingest them.

II. The number of bacteria which can be ingested is of varying quantity.

III. The number of bacteria which can be ingested depends upon their preparation by substances present in the blood, known as opsonins.

The opsonic index may be defined as the relation of the ingesting power of the leucocytes of an infected individual to the ingesting power of the leucocytes of a normal individual. Experimentation has shown that this ratio or the "appetite" of the leucocyte of the individual for the infecting organism can be increased by injecting into him killed cultures of the organism with which he is infected. The technique of this determination is due to the tireless energy of Wright. It is familiar to the readers of current literature, as there have been commendable articles upon the subject in practically all of the leading journals. Beck reports the following ear cases treated by the vaccine method:

Two of chronic purulent otitis media of a double infection, viz., staphylococcus and pneumococcus (bilateral).

One of chronic purulent otitis, radical mastoid; Friedlander's bacillus infection.

One of chronic purulent otitis, unilateral; ossiculectomy; diphtheria infection.

One of acute purulent otitis media, bilateral; diphtheria-like bacillus infection following an attack of grippe.

"All these cases had, previously to the vaccination treatment (auto-genous), the usual accepted methods of treatment without results. All of them were subjected to the opsonic index, which was lower than normal; one as low as .3—the nearest to the normal was 0.76. In all but one case I depended almost exclusively on the clinical manifestations as an index and used the average time of ten days between vaccinations. Without exception, there is a distinct improvement and some of the cases are cured, although not long enough time has elapsed in the chronic cases to be absolutely certain."

Magruder reports a case of purulent otitis in which paracentesis in the incipency had been refused and which resisted all usual forms of treatment for a period of sixty-one days. The infection was a pneumococcus of the middle ear without apparent involvement of the mastoid. Six days after the first injection the ear was dry. Magruder and Webb consider that this is the first case treated in Colorado, if not in the United States. Ten months after treatment there had been no return of the discharge.

Levy has recently collected reports of forty-eight ear cases in the vicinity of Denver. He tabulates them as follows:

	Cured.	Improved.	Not Improved.	Total.
Acute-purulent otitis media—				
With mastoid involvement....	11	1	1	13
Without mastoid involvement...	8	..	3	11
Chronic purulent otitis media—				
Without mastoid involvement...	13	6	5	24
	<hr/> 32	<hr/> 7	<hr/> 9	<hr/> 48

"All the cases above received the usual conservative treatment, such as drainage and irrigation. Many of the mastoid cases were operated upon. In a number of cases secondary operations were performed. The most striking results were obtained in those cases where unhealed mastoids existed, manifesting themselves in recurrences after a greater or shorter period of time." Levy does not consider the opsonic index an absolutely accurate guide as to dosage and believes that clinical evidence alone is unsatisfactory. Nevertheless he considers "careful clinical observation" to be of more value than laboratory reports.

Tod, in the *Practitioner*, reports four cases of tuberculous otitis in which vaccine therapy had been used with gratifying results, while Jacobs, at a recent meeting of the Ophthalmological and Otological section of the Cleveland Academy of Medicine, reported six cases. Of this number two were cured and four were improved. One of the improved cases did not continue the treatment sufficiently long to exclude the possibility of ultimate cure.

Jacob's first case is interesting and belongs to that class of cases suggested by Levy as being most favorable for vaccine treatment. A pre-

liminary acute otitis had been followed by paracentesis and later a mastoid operation. Four months after operation there was still a discharge from the ear as well as from the mastoid wound. A prominent otologist had advised the radical operation. Cultures from the ear showed many colonies of staphylococcus aureus and a few colonies of streptococcus. Cultures from the wound showed only staphylococcus aureus. Vaccine was at first made from the staphylococci alone and the discharge decreased materially. It did not cease, however, until combined with injections of streptococci. In the original cultures the colonies of streptococci had been so few in number that the infection with this organism was thought to be accidental, playing no part in the original process.

Vaccine therapy in cases of otitis presents certain obstacles. The specific infecting organism is rarely determined at the beginning of the discharge. Later, this organism can only be determined with difficulty, possibly it cannot be determined at all; for with the discharge in constant communication with the outside air the possibility of secondary infection is great. We would then have to deal with two or possibly more organisms in preparing a vaccine. This may account for some failures in bringing about results. Cases of otitis media, too, are frequently complicated with an osteonecrosis, or with cholesteatomata. Bacteriologists assert that the former need be no contraindication to vaccine therapy, or of necessity prevent a successful outcome. Manifestly, nothing can be expected if the case is complicated with cholesteatoma. The technique, too, is difficult, requiring extensive equipment and the expenditure of considerable time on the part of the consulting bacteriologist. In persons of limited means the expense involved would prove a decided obstacle, while ward and dispensary cases could only be treated in hospitals having practically the exclusive services of a bacteriologist. These many difficulties, however, should not deter us from the application of a remedy which in its limited use thus far has given some brilliant results and promises apparently more results for the future.

The summary of the conclusions reached would seem to be as follows:

- I. Vaccine treatment in cases of purulent otitis can do no harm.
- II. It should be tried in all cases which prove resistant to the usual and accepted forms of treatment.
- III. The treatment should be extended over a considerable period of time.
- IV. Definite conclusions as to the final success must for the present be held *sub judice*.

UROTROPIN AS AN INTERNAL ANTISEPTIC.

A REVIEW OF RECENT LITERATURE.

By WM. ENGELBACH, M. D.

1. Frothingham (*Archives of Internal Medicine*, November 15, 1909, p. 510).
2. Butlerow (*Ann. d. Chem. u. Pharm. Liebigs*, 1860, 115-332).
3. Nicolaier (*Deutsch. med. Wchnschr.*, 1895, 541).
4. Casper (*Deutsch. med. Wchnschr.*, 1897, Thearap. Beilage, p. 75).
5. Mendelsohn (*Berl. klin. Wchnschr.*, 1898, 48).
6. Richardson (*Jour. Exper. Med.*, 1899, iv. 19).
7. Buttersack (*Med. Correspbl. d. Wurthem. arz. Ver.*, October 14, 1905).
8. Coleman (*Medical News*, New York, 1903, lxxxiii, 393).
9. Karwowski (*Monatschr. f. prakt. Dermat.*, 1906, xlii, 8).
10. Easton (*Boston Med. and Surg. Jour.*, 1905, p. 7).
11. Crowe (*Johns Hopkins Hosp. Bull.*, 1908, xix., 109).

Frothingham reviewed the history, action and use of urotropin up to the present time, and gave some valuable animal experiments demonstrating the effects of large doses of this drug, especially upon the mucous membrane of the stomach.

Hexamethylenamin, or, as it is commonly called, urotropin, was first prepared in 1860 by Butlerow. It is made by the action of ammonia on formaldehyd. It is readily broken up by heat, certain acids, etc., into formaldehyd and ammonia.

Nicolaier first introduced the drug into medicine in 1894. He concluded that it stimulated the secretion of urine, prevented the growth of bacteria in the urine, and acted as a solvent of uric acid calculi. In some cases he gave as much as 150 grains in a day without producing symptoms. On the other hand, smaller doses after prolonged use, would, occasionally, cause burning in the region of the bladder, and the appearance of the epithelial cells in the urine; and if the drug was still continued, red blood corpuscles would appear in the urine. As a result of these observations many physicians began to use this drug.

Casper and Mendelsohn showed that it did not act as a solvent of uric acid calculi within the body. They, and other authors, especially Richardson, confirmed Nicolaier's views in regard to the power of hexamethylenamin to act as a urinary disinfectant, especially in typhoid fever. Casper also thought it was of value in curing phosphaturia. From that time on urotropin has been used in typhoid fever and in cases of cystitis and pyelitis due to other agents than the gonococcus or tubercle bacillus.

Richardson found that in cases with an existing nephritis, the administration of hexamethylenamin caused not only an increase in albumin and casts, but also, in some cases, apparently caused a diminution of these elements.

Buttersack also advocates the prolonged administration of urotropin

as a prophylactic measure to prevent the development of nephritis in scarlet fever. Nephritis, as a rule, develops between the twenty-first and twenty-fifth day of scarlet, and previous writers have advocated time, but Buttersack points out that urotropin is rapidly excreted, and advocates its administration continuously up to the twenty-first or twenty-fifth day. In a series of thirty-four cases treated on this plan, he had no instance of nephritis, though in a few cases a trace of albumin suddenly appeared, with a few hyaline and epithelial casts, but without edema or alteration in the quantity or appearance of the urine.

Since the introduction of hexamethylenamin in therapeutics, reports of evil effects caused by this drug have been gradually accumulating. In the cases reported the amount of the dose and the length of time over which the drug was given, vary greatly. Even in the same individual the same dose acts differently at times.

Coleman, from the literature and from his own experience, reported, in 1903, the following list of symptoms in human cases following the use of hexamethylenamin, which, in some of the cases, had been given in small doses: Irritation of the stomach, diarrhea and abdominal pain, irritation of the skin with a rash like that of measles, headache and ringing in the ears, irritation of the kidney and the bladder, hematuria and hemoglobinuria. In these cases, Coleman thinks the blood is probably derived from the bladder.

In 1906 Karwowski and Rosen also summed up the ill effects which might arise from the use of hexamethylenamin, but did not add anything essential to the report of Coleman. As a result of all these communications hexamethylenamin, in small doses, is considered a safe drug for most people, and also in large doses up to the appearance of symptoms. When symptoms appear the discontinuance of the drug causes a subsidence of symptoms. None of these writers, however, has inquired into the tissue changes back of these symptoms.

Easton has tested the effect of urotropin in typhoid fever at the Massachusetts General Hospital. During one year every typhoid patient was given the drug daily. As soon as convalescence was established it was stopped, and examination six to ten days afterwards of 46 cases showed that the urine was clear and developed no growth. Altogether, 486 patients were given urotropin, as a rule in doses of 8 to 10 grs. thrice daily. There were three cases of painful micturition, two of hematuria, and in several cases a few red blood cells appeared in the urine, but they all cleared up on stopping the drug for a few days. The moderate use of urotropin during the course of the disease prevents cystitis and other genito-urinary complications, and, by making the urine innocuous, makes the early discharge of convalescent patients harmless to the community.

In 1908 Crowe showed that typhoid bacilli could be killed in the gall-bladder of man, as well as in the urine, by the administration of hexamethylenamin, provided that sufficiently large doses were used. He demonstrated the presence of hexamethylenamin in the bile, cerebrospinal fluid, synovial fluid, saliva, pleural effusions and blood of man. Also, he asserted that it acted favorably upon other forms of infection in cavities where the hexamethylenamin was found present. For killing typhoid bacilli in the gall-bladder, 75 grains a day for several days are necessary. As a result of these findings it seems possible that even larger doses might be of value in other infections.

There were three main problems to be solved in doing this work: 1. How much hexamethylenamin per body weight can be given to a guinea

pig without producing fatal symptoms? 2. What lesions, if any, are produced by one or two very large or fatal doses of this drug? 3. What lesions, if any, appear after repeated sublethal doses?

In these experiments the hexamethylenamin was dissolved in sterile water and injected subcutaneously. Guinea pigs vary somewhat in their ability to withstand the drug, but as a rule $4\frac{1}{2}$ to 5 grains per ounce of body weight will kill the pig, or render it very quiet for twelve to fourteen hours. One pig, however, survived a dose of $6\frac{1}{2}$ grains to the ounce. As it takes a considerable amount of boiled water to put a fatal dose of hexamethylenamin into solution, one pig, as a control, was injected with this amount of water. The animal did not suffer any ill effects. If the dose proves fatal it usually does so within a few hours. If the animal survives twenty-four hours, it recovers. After a fatal dose the pigs grow more and more quiet, and in the course of two or more hours usually topple over, have some slight twitching of the extremities, and gradually die. Others have been found in a sitting position, which suggested that they grew more and more quiet and then died. In none were any convulsions noted. The pigs are able to withstand sublethal doses for a considerable period of time without any ill effects other than reaction at the point of injection and some quietness for a few hours after the injection. By the next day, however, they are lively again. One animal weighing 20 ounces, for instance, received 375 grains in eight doses during nine days. The doses were each 45 grains, except one of 60 grains. Five days after the last injection the animal appeared lively and perfectly well, showed some reaction at the site of inoculation, which was rapidly improving, and had lost only 2 ounces in weight. On that day it received a fatal dose. Another pig, weighing 18 ounces, took 15 doses in nineteen days, amounting in all to 319 grains, and gained 1 ounce in weight. Eight or nine days later it was given 75 grains, which it survived, and two weeks later had gained 2 ounces. In the animals which received one or two large doses the findings were practically the same, whether the doses proved fatal or not. At the point of inoculation there was edema of the subcutaneous tissue and muscle, with congestion and some hemorrhage. Of the twelve guinea pigs in this group, two showed free fluid in the peritoneal cavity. Both of these received fatal doses. It was felt at the time that one of these animals received some of the injection intraperitoneally; and this suspicion was practically confirmed at autopsy by a subperitoneal hemorrhage on the stomach wall near the site of suspected entrance of needle. As none of the other ten pigs in this group showed free fluid, it seems fair to assume that the other case of free fluid was due to a perforation into the peritoneum while injecting the animal. In these twelve animals there were no macroscopic lesions of any organ other than those mentioned above, except in the stomach. In eleven of these twelve cases the stomach was examined and in two cases submucous hemorrhages were present. These areas will be referred to later under the microscopic findings.

OBITER DICTA FROM FOREIGN JOURNALS.

RADIUM THERAPY.

The subject of the treatment of various skin affections by radium is being widely discussed in foreign medical journals, and already the rather unedifying spectacle is being unrolled before us of two camps, English and French, imbued with diametrically opposite ideas. For some time the French have led in enthusiasm, and though enthusiasm is an excellent quality when its virtues infuse any new movement, it has this drawback: calmness only too often suffers and the straight path of truth is somewhat obscured. This is no indictment of Gallic veracity, but merely indicative of how medical thought may be unduly influenced by an imagination carried to dizzy heights by a few successes. The English, on the other hand, are as usual, exceedingly sober and insular; and being such by nature, are prone to view brilliant achievements other than their own with a critical eye. That a controversial spirit should have entered into the matter of so important a therapeutic agent as radium, ought to invite criticism, for the results of bickerings will not further our knowledge as to what are the real successes resulting from its application. Dr. Henry T. Butlin, in his article entitled "On Radium in the Treatment of Cancer and Some Associated Conditions" (*Lancet*, November 13, 1909), voices what we take to be the English attitude; and even though we might criticize British intolerance as expressed in the writer's viewpoint, we cannot but admire his sanity. As a counterblast to his unbelieving front, we have Dr. Masotti's contribution, "Les dermatoses justiciables de la radiumthérapie," in *Le Progrès médical*, of December 18, 1909. Enthusiasm, according to certain authorities, is really not so despicable a quality that it should be altogether denounced; hence, the following free translation is given in the hope that American readers may know the French status of thought in regard to radium as a therapeutic measure:

Nevus, be it vascular or pigmentary, is the skin affection which best illustrates the superiority of radium as a therapeutic agent. Since nevi vasculares vary as to color and extent, each case ought to be specially studied and subjected to a treatment *ad hoc*. When the color is red, the applications should be brief. If the nevus is purple, it is necessary to be more energetic in the treatment, since in this sort there is increased vascularization and the blood-vessels to be destroyed are more numerous. If the affection is deeper, the sittings should be prolonged because it is necessary to destroy the vessels deeper down. In young children, the applications may be made during sleep, or better still, while nursing. The location of the nevus is of importance in the treatment, since radium is only effective on parts that are completely immobile; therefore, it is difficult to obtain good results on the lids, the commissure of the mouth, and the frontal muscle. In these instances a longer time is required to effect a cure. For the details of the technique reference is made to "Traitement des dermatoses par le radium."* The first case was a nevus of a purple aspect, occurring on the lower lid of a young girl. Several sittings sufficed to cure her completely. No apparent trace was left; an important matter to remember, since the technique ought to aim at the complete obliteration of the vessels without producing atrophy, cicatrices, pigmenta-

*By Dr. Masotti, Paris: Baillière et fils.

tion, or telangiectasis. As regards nevi pigmentares, the treatment is quite simple. To activate the treatment it is necessary to remove as much of the fatty tissue as possible, because this would arrest a certain number of rays which it is important to utilize. As to cosmetic defects, one sitting suffices to cause them to disappear, though a complementary treatment, such as electrolysis, may be conjoined with radium to expedite and complete the good results. The treatment of angiofibromas by radium requires longer sittings; Dr. Milian believing that the resistance is due to the abundance of connective tissue and the sclerosed blood-vessels.

Nevi are not the only skin affections amenable to the action of radium. Among others, keloids, epitheliomas, senile verrucas, and leukoplakia well illustrate the triumphs of this comparatively new physical agent. Cicatrices, which are benefited by radium, may be divided into three categories: depressed cicatrices, keloids, and fibrous cicatrices. In depressed cicatrices, the surrounding healthy skin being raised, the cicatrix is more evident. The treatment to be more advantageous must take into consideration the lessening of the projecting skin. To effect this, short applications must be made to the surrounding skin and the result is, that instead of its edges being sharp, they are sloping. In this way only, may one achieve a result which will do much to palliate the untoward aspect of a cicatrix which, up to now, has defied all treatment. In the majority of cases keloids represent scrofulous or tuberculous manifestations. The results obtained by radium in these cases are rapid and cosmetically perfect. A young woman with a projecting keloid on her neck, which was red and turgid, was cured after a sitting of several hours; the skin re-forming as supple as possible. The most stubborn cicatrices are the fibrous. They are hard as leather and are shaped like a cord. The special treatment for these cases is necessarily energetic. To expedite a cure scarifications prior to the sittings should be made.

Another affection that attests to the miraculous workings of radium is epithelioma. The sitting should be gauged according to the amount of infiltration. Sprouting epithelioma appears to be the special kind to illustrate the virtues of radium. The projections melt away, so to speak, and if we are to believe Dr. Danlos the cases treated by him in 1904 have as yet shown no signs of recurrence.

In extensive tumors, what is known as "filtrage" should be employed, since this stops the superficial rays which are capable of provoking radio-dermatitis, and allows only the penetrating rays to pass. Lead sheets of variable thickness (5 to 20mm.) according to the apparatus used are effective in arresting the superficial rays. When it is remembered that the sittings occupy some twenty-four hours, the importance of guarding the skin against irritation becomes very evident.

An epithelioma on the side of the nose, which had resisted all treatment, including the x-ray, for five years, was cured after ten hours' treatment during one week. The good results have lasted for some months. Another case of epithelioma of the left lower lid in a young man, which had been present for three years, was cured after one sitting lasting half an hour. As regards verruca senilis the treatment by radium is the best and the most rapid. A sitting of from one-half to three-quarters of an hour suffices to dissipate the growth. The results obtained in leukoplakia are quick and satisfactory. A sitting of three-quarters of an hour effects a cure. The mucus membrane becomes ulcerated, and for some days the patient is inconvenienced by the ulceration. If the leukoplakia is on the tongue, the cicatrization is rapid. By commenting on the principal skin affections benefited by radium one thing is incontestible, namely the superiority of this treatment over all other sorts of medication.

BOOK REVIEWS.

THE DISEASES OF CHILDREN. By Henry Enos Tuley, M. D., Professor of Obstetrics, University of Louisville, Medical Department; Visiting Physician Masonic Widows' and Orphans' Home; Secretary of the Mississippi Valley Medical Association; Ex-Secretary and Ex-Chairman of the Section on Diseases of Children, American Medical Association, etc. Illustrated. Baltimore. Southern Medical Publishing Company. 1909.

In this book, of less than six hundred pages, the attempt is made to cover the entire field of pediatrics, and there are even added chapters on diseases of the eye, ear, nose, throat and skin. As a consequence, much of the matter is too greatly condensed, and its value thereby lessened. This is notable, to select special instances, in the article on Tuberculosis and on Rickets. The entire section on Diseases of the nervous system, shows the same fault. The chapters on Infant Feeding are very good, and space is given to a discussion on the work of Medical Milk Commissions. One notices certain inaccuracies such as (p. 137), the recommending of meat before the use of cereals and vegetables for children just over a year of age. On p. 285, the use of Castor-Oil with male fern is recommended as an anthelmintic. (This forms a poisonous compound.) Craniotabes in rickets is not mentioned. The use of Salicylates in the treatment of chorea is not mentioned, though the relationship of chorea and rheumatism is noted. The article on appendicitis is very good; so, too, the one on diphtheria. A valuable note on periods of incubation and quarantine of the exanthemata is added. The book is, however, full of practical suggestions, and inasmuch as the author states that it is not written for the specialist, but with the needs of the general practitioner and student in view, it may perhaps be said to fulfill its function.

COMMON DISORDERS AND DISEASES OF CHILDHOOD. By George Frederick Still, M. A., M. D. (Cantab.), F. R. C. P. (London), Professor of Diseases of Children, Kings College Hospital; Physician to Out Patients, Hospital for Sick Children, Great Ormond St.; Honorary Member American Pediatric Society. London: Henry Froude, Oxford University Press; Hodder & Stoughton, Warwick Sq., E. C., 1909, pp. 708.

This book differs from the ordinary run of text books on diseases of children, in that it does not pretend to present a complete summary of present day knowledge of pediatrics. Instead of the conventional text book rubric, the author devotes his forty-eight chapters to a consideration of some of the commoner disorders of childhood. The book is a singularly individualistic one which, to those acquainted with Dr. Still's writings, will mean that it is very well worth the reading.

The discussions of mentally deficient children, of nervous children, of disorders of speech, and of habit spasms afford excellent examples of short and valuable monographs.

The diseases of the respiratory and gastrointestinal tracts are considered in detail; so are the questions of feeding, hygiene and development. The acute exanthemata are not considered. The book is to be highly recommended, not only for its contents but for the delightfully clear and lucid style of presentation of its subject matter.

MODERN MATERIA MEDICA AND THERAPEUTICS. By A. A. Stevens, A. M., M. D., Professor of Therapeutics and Clinical Medicine, Woman's Medical College of Pennsylvania; Lecturer on Physical Diagnosis in the University of Pennsylvania; Physician to the Episcopal Hospital and to St. Agnes's Hospital; Assistant Physician to the Philadelphia General Hospital; Fellow of the College of Physicians of Philadelphia, etc. Fifth Edition, Thoroughly Revised in Conformity with the Eighth Revision (1905) of the United States Pharmacopœia. Philadelphia and London. W. B. Saunders Company.

This large edition is the fifth revision of the author's modern materia medica and therapeutics. It embraces a thorough exposition of materia medica con-

sidered from the latest viewpoint. Besides the ordinary drug materia medica, there are short and decisive chapters descriptive of remedial measures other than drugs,—such as electricity, massage, movement therapy for locomotor ataxia, the Schott or Nauheim treatment of cardiac disease, application of cold and heat, hypodermoclysis and infusion, enteroclysis, lavage of the stomach, bloodletting, actinotherapy, Roentgen rays, radium and lumbar puncture. All methods are then combined in a third section of the book, the section on applied therapeutics. These chapters deal with infections, constitutional, blood and ductless gland diseases and the diseases of each system. The perfect arrangement and the procedure of the practical application of the material in this book besides the actual value of the facts presented, commend it as one of the most advanced text books in its field.

PRINCIPLES OF PHARMACY. By Henry V. Arny, Ph.G., Ph.D., Professor of Pharmacy at the Cleveland School of Pharmacy, Pharmacy Department of Western Reserve University. Octavo of 1175 pages, with 246 illustrations, mostly original. Philadelphia and London. W. B. Saunders Company. Cloth, \$5.00 net; half morocco, \$6.50 net.

The intention of this book is to explain the pharmaceutical standpoint in such a way that this is evident to the average students without further search. The book consists of seven parts. Besides the exhaustive manner in which the entire subject is elucidated, Chapter 5, dealing with prescription writing and compounding, is worthy of the consideration of every druggist as well as physician.

THE PRACTICE OF MEDICINE. A Text-Book for Practitioners and Students, with Special Reference to Diagnosis and Treatment. By James Tyson, M. D., Professor of Medicine in the University of Pennsylvania and Physician to the Hospital of the University; Physician to the Pennsylvania Hospital; President of the College of Physicians of Philadelphia; Member of the Association of American Physicians, etc. Fifth Edition, Revised and Enlarged. With Five Plates and 245 Other Illustrations. Philadelphia. P. Blakiston's Son & Co., 1012 Walnut Street.

This is a fifth edition of the author's well-known text-book. Section 13, on animal parasites, is one of the best essays on this subject in the literature. The classification and the direct decisive manner with which the author considers the subject's matter, make this book of a special value to the student as well as to the general practitioner.

THE BLOOD IN HEALTH AND DISEASE. By R. J. M. Buchanan, M. D., F. R. C. P. Professor of Forensic Medicine in the University of Liverpool; Honorary Physician to Out-patients, Liverpool Royal Infirmary. Formerly Honorary Physician, Stanley Hospital, Liverpool; Honorary Assistant Physician to the Hospital for Consumption and Diseases of the Chest, Liverpool. London. Henry Frowde, Hodder & Stoughton. Oxford University Press. Warwick Square, E. C.

The author has presented in this work a complete study of the blood in disease and health, with the exception of parasitic diseases of the blood. It is remarkable for the advanced ideas expressed in almost every chapter. The technique of hematology includes recent methods for the estimation of the salts of the blood, its viscosity, alkalinity, opsonic index, coagulability, and other well known methods. In the morphology of the blood the most recent developments are depicted; for instance, the maduca shape of the red cell as discovered by Wiedenrich, instead of the biconcave as described by all previous text books. The classification of blood diseases is simplified and placed upon a more stable basis than has hitherto been attempted. As an illustration, the author is inclined to classify many of those pictures of acute lymphatic leukemia and leukanemia as acute myeloid leukemia. This is based upon his interpretation of many of the non-granular or slightly granular mononuclear cells occurring in this disease, as being immature forms of myelocytes. Other communications in the literature within the last few years warrant the justification of such a classification. The chapter on chloroma is one of the most distinctive descriptions of this disease existing. The very numerous colored plates which are accurate reproductions of the blood pictures and cells, are unquestionably among the best to be found in the literature. The only criticism which the book allows is, possibly, the absence of a few minor details in technic. Few publications upon this or any other subject in medicine within the last few years offers much new and valuable knowledge. It can be highly recommended for every capacity for which such a guide and text is needed.

VACCINE AND SERUM THERAPY. Including also a Study of Infections, Theories of Immunity, Opsonins and the Opsonic Index. By Edwin Henry Schorer, B. S., M. D., Assistant Professor of Parasitology and Hygiene, University of Missouri; formerly Assistant Rockefeller Institute for Medical Research, New York City. Illustrated. St. Louis, C. V. Mosby Co. 1909.

This book thoroughly reviews, classifies and precisely and accurately presents the present day value of vaccine and serum treatment. General consideration of infections and immunity are based upon the scientific investigation as exemplified mainly by Ehrlich's side-chain theory. Considerable space has been given to opsonins, the opsonic index and their importance in health and disease. The preparation of vaccines, their indication and technic for use have been given detailed consideration. Serum therapy has been thoroughly reviewed and special usage as modified by late communications has been thoroughly demonstrated. The book represents the work of one who has had a great deal of personal experience in the field and whose original work and research in bacteriology is apparent throughout its pages. The conservative conclusions, regarding the absolute value of this treatment from such an authority makes it an exceedingly reliable work on all that pertains to this subject.

TREATMENT OF THE DISEASES OF CHILDREN. By Charles Gilmore Kerley. Professor of Diseases of Children in New York Polyclinic Medical School and Hospital. Attending Physician to the New York Infant Asylum; Assistant Attending Physician to the Babies' Hospital, etc. Second Edition, revised. Philadelphia and London. W. B. Saunders Company. 1909.

The reception accorded this book when it first appeared, was most hearty and most deservedly so. The book really fills a long-felt want, in that it devotes itself to the special phases of treatment of diseases in early life. The author has drawn upon a rich and varied experience, and his clear and explicit discussions make the book most valuable, as a reference work. The second edition presents a careful revision of the whole work. Special attention may be called to the chapters on Nutrition and Growth, Gastro-Enteric Disease and Diseases of the Respiratory Tract. There is added in this edition a chapter on vaccine therapy. In this chapter no reference is made, however, to the use of vaccine treatment in gonorrheal vulvovaginitis. The chapters on gymnastic therapeutics, and on drugs and drug dosage, are of very distinct value. A very carefully prepared index adds to the usefulness of the book. On the whole, the book is most highly recommended to those having the care of children.

AN EPITOME OF DISEASES OF WOMEN. By Charles Gardner Child, Jr., M. D., (Yale), Clinical professor of Gynecology, New York Polyclinic Medical School and Hospital. 12mo, 210 pages, with 101 engravings. Cloth, \$1.00, net. Lea & Febiger, Publishers, Philadelphia and New York, 1909. (*Lea's Series of Medical Epitomes.* Edited by Victor C. Pedersen, M. D., New York.)

To present the essentials of a large subject within the limits of a small book is a difficult task. It seems that the author has solved this problem with unusual satisfaction. His views are up-to-date, concisely expressed and made very clear by a careful selection of good illustrations.

A PRACTICAL TREATISE ON DISEASES OF THE SKIN. For the Use of Students and Practitioners. By J. Nevins Hyde, A. M., M. D., Professor of Dermatology and Venereal Diseases in the University of Chicago, Medical Department (Rush Medical College). New (8th) edition, thoroughly revised and much enlarged. In one very handsome octavo volume of about 1137 pages, with 223 engravings and 58 full-page plates, in colors and monochrome. Cloth \$5.00, net; leather, \$6.00, net. Lea & Febiger, Philadelphia and New York. 1909.

When a work has passed through its original edition and seven successive revisions, its acceptance by the profession as a standard is beyond question. None of the previous revisions, according to the statement of the author of the volume, has been as painstaking, and as a result of the effort to embody all the numerous recent advances of dermatology 250 pages had to be added and the number of plates and engravings doubled.

PRACTICAL BACTERIOLOGY, BLOOD WORK AND ANIMAL PARASITOLOGY. Including Bacteriological Keys, Zoological Tables and Explanatory Clinical Notes. By E. R. Stitt, A. B., Ph. G., M. D., Surgeon, U. S. Navy; Graduate London School of Tropical Medicine; Instructor in Bacteriology and Tropical Medicine, U. S. Navy Medical School; Lecturer in Tropical Medicine, Jefferson Medical College. With 86 Illustrations. P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia. 1909. Price, \$1.50.

This book is an excellent work for study by those who wish to acquire a practical knowledge of clinical bacteriology and parasitology. Instead of dealing with the mass of theoretical knowledge which is usually given in a text book of this kind, it takes up only that part of the subject which has actual value in identifying bacteria and parasites and can be used as clinical evidence in the study of these diseases. The details of technique are drawn from the most recent developments. The numerous cuts, all of them photographic reproductions, illustrate the text very elaborately. The tables and bacteriological keys are numerous and add to the value of a work of this kind, particularly in the differentiation of bacteria. It is a most suitable guide for the laboratory worker.

OBSTETRICS. A Manual for Students and Practitioners. By David J. Evans, M. D., Lecturer on Obstetrics in McGill University, Montreal; Fellow of the Obstetrical Society of London. New (2d) edition, enlarged and thoroughly revised. 12mo, 440 pages, with 169 illustrations. Cloth, \$2.25, net. Lea & Febiger, Philadelphia and New York. 1909.

This is an excellent presentation of the essentials of obstetrics, including, in the new edition, the latest contributions to our knowledge while carefully eliminating all that has been proven useless or unreliable.

CLINICAL TREATISES ON THE PATHOLOGY AND THERAPY OF DISORDERS OF METABOLISM AND NUTRITION. Part VIII. By Prof. H. Strauss. Authorized American Edition. Translated under the direction of Nelles Barnes Foster, M. D., New York; E. B. Treat & Co. 1909.

Strauss's intimate knowledge of diseases of metabolism in general makes him specially capable of presenting a profound thesis on gout. This volume is characteristic of the author's writings in general,—thorough and concise. He divides the subject into four chapters: The Differentiation of Gout; Pathogenesis of Gout; Therapy of Gout; and the Symptoms of Uricacidemia. The last named chapter is specially commendable.

ZEITSCHRIFT FUER GYNAEKOLOGISCHE UROLOGIE. Herausgegeben von Prof. Dr. W. Stoeckel. Verlag von Johann Ambrosius Barth. Leipzig. Jeder Band enthaelt 6 Hefte. Preis des Bandes M. 10.

A special journal for "Gynecologic Urology" at first thought might arouse some doubts concerning the wisdom of carrying the specialization of journals thus far. The task of keeping familiar with all the current literature is a necessary but difficult one for the specialist, and surely is rendered very onerous by the multiplicity of journals already in existence. Gynecologic urology is one of the very recent developments in specialization and owes its life chiefly to the assiduous work of Stoeckel, editor of this new "Zeitschrift," the first volume of which is now complete. After careful perusal of the six numbers constituting the first volume little doubt is left in the mind of the reader of its opportuneness. Contributions on this special subject are so numerous and of such scientific and practical importance that they certainly warrant the existence of the "Zeitschrift fuer gynaekologische Urologie." Without doubt it is a publication which should be in the hands of the urologist, the gynecologist, and, as a matter of course, of the many-sided general surgeon.

THE BACTERIOLOGY OF DIPHTHERIA. Including sections on the history, epidemiology and pathology of the disease, the mortality, the toxins and antitoxins, and the serum treatment. By F. Loeffler, Arthur Newholm, F. B. Mallory, G. S. Graham-Smith, George Dean, William H. Park, Charles F. Baldwin. Edited by G. H. F. Nuttall and G. S. Graham-Smith. Cambridge University Press, England.

The names of the authors of this volume of 718 pages alone show that it is a work by only the most authoritative writers on diphtheria. It is not only a compilation of the knowledge acquired about this disease, but also contains a great number of original observations, especially by Graham-Smith. The book will be an important source of information to men working on diphtheria and

the many obscure problems that are not yet solved. Its main value is the reference that it gives to all the intricate sides of diphtheritic processes, and to the state up to which they have been worked out, by a nearly complete bibliography of diphtheria.

THE PRINCIPLES OF HYGIENE. A Practical Manual for Students, Physicians and Health Officers. Third Edition. By Dr. D. H. Bergey. W. B. Saunders Co. 1909.

Bergey's book is so well known that in the review of this third edition we need only express our appreciation of its appearance. In the four years since the last edition was published many new problems of hygiene and sanitation have greatly advanced; these receive the thorough consideration of the author and make the book again up to date.

TEXTBOOK OF EMBRYOLOGY. By Frederick Randolph Bailey and Adam Randolph Miller. With 515 illustrations. New York. William Wood & Co. 1909. Price \$4.50.

The method of presentation of the subject is clear and well written; the illustrations are numerous and good. It can be recommended for the use of students.

THE PRINCIPLES OF PATHOLOGY. Volume II. Systemic Pathology. By J. George Adami, M. D., and Albert G. Nicholls, M. D. Philadelphia and New York. Lea and Febiger. 1909.

The second volume of this classic modern work on pathology deals with the special, or, as the authors logically call it, systemic pathology in the length of the discussion on the subject so concisely that it fills only the same number of pages as the first volume of his book. He explains this by the thorough grasping of the principles of general pathology. The reader of the second volume will not need the same explicit considerations as dealt with in the first volume. The shortness in the other works of general and special pathology combined, is characteristic of the shortness of the general pathology. In other works Adami lays more stress on the study of the causative effect of the pathologic processes, than on the pure statement of the material changes. This is seen in any of the chapters of his book that deal with the different "systems" of the body. Although they are separate from each other, through all of them runs the same principle of consideration of the processes. Only when particular conditions obtain are the discussions prolonged. The chapters on blood, especially the one on the effects of the closure of vessels, are particularly interesting and the same may be said concerning the discussion of the digestive functions and disturbances. The section on the nervous system is very concise and very restricted in definite conclusions. Altogether, the different systems are dealt with in a logical way of explanation, with the exclusion of vitalis and teleology; in certain portions teleology has not been entirely eliminated. A detailed review of the single parts of the book is impossible. Whoever is working along scientific methods in pathology will not need to be told that Adami's and Nicholls' Pathology has been finished.

BOOKS RECEIVED.

MINER'S NEW COMPLETE OBSTETRIC RECORD. Combining with the usual Record all desirable Medical Statistics, together with a Medical History of the Pregnancy, and of the Life of the Child. Improved Edition, giving all medical data bearing upon the problem of heredity. Published by Joel A. Miner, Ann Arbor, Mich. Price: For 420 Cases, \$1.50, delivered by mail.

THE PRACTITIONERS' VISITING LIST FOR 1910. A pocket-sized book containing memoranda and data important for every physician, and ruled blanks for recording every detail of practice. Weekly, Monthly and 30-Patient Perpetual contain 32 pages of data and 160 pages of classified blanks. The

60-Patient Perpetual consists of 256 pages of blanks alone. Price by mail, postpaid, to any address, \$1.25. Thumb-letter index, 25 cents extra. Lea & Febiger, Publishers, Philadelphia and New York.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences, edited by Hobart Amory Hare, M. D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College, Philadelphia, assisted by H. R. M. Landis, M. D., Assistant Physician to the Out-Patient Department of the Jefferson Medical College Hospital. Lea & Febiger. Six Dollars per Annum. Volume IV. December, 1909. Contents: Diseases of the Digestive Tract and Allied Organs, the Liver and Pancreas by David L. Edsall; Diseases of the Kidney by John Rose Bradford; Surgery of the Extremities, Tumors, Surgery of Joints, Shock, Anesthesia and Infections by Joseph C. Bloodgood; Genito-Urinary Diseases by William T. Belfield, and Practical Therapeutic Referendum by H. R. M. Landis. Index.

THE ORIGIN AND PREVALENCE OF TYPHOID FEVER IN THE DISTRICT OF COLUMBIA. By M. J. Rosenau, L. L. Lumsden and Joseph H. Kastle. Washington, Government Printing Press. Treasury Department. Hygienic Laboratory. Bulletin No. 52. October, 1909.

UEBER DAS WESEN, DIE TECHNIK UND KLINISCHE BEDEUTUNG DER SERODIAGNOSTIK DER LUES. Von Dr. E. Scheidemantel. Wuerzburger Abhandlungen aus dem Gesamtgebiet der praktischen Medizin. X. Band, 1. Heft. Wuerzburg, A. Stuber's Verlag. 1909. M. 85.

A PRACTICAL STUDY OF MALARIA. By William H. Deaderick, M. D., Member of the Arkansas Medical Society, American Medical Association, and American Society of Tropical Medicine; Fellow of the London Society of Tropical Medicine and Hygiene; Corresponding Member Société de Pathologie Exotique (Paris); President of the Tri-State Medical Society. Fully Illustrated. Price, Cloth \$4.50 net. Philadelphia and London. W. B. Saunders Company, 1909.

SURGERY; ITS PRINCIPLES AND PRACTICE. By Various Authors, edited by William Williams Keen, M. D., LL.D., Emeritus Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia; and John Chalmers DaCosta, M. D., Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia. Volume 5 with 550 Illustrations, 45 of them in Colors. Price, Cloth, \$7.00 net. Philadelphia and London. W. B. Saunders Company. 1909.

THE PRACTICAL MEDICINE SERIES. Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial charge of Gustavus P. Head, M. D., Professor of Laryngology and Rhinology, Chicago Post-Graduate Medical School. Volume 5 Obstetrics. Edited by Joseph B. De Lee, A. M., M. D., Professor of Obstetrics, Northwestern University Medical School with the Collaboration of Herbert M. Stowe, M. D. Series 1909. Chicago. The Year Book Publishers, 40 Dearborn Street.

THE PRACTICAL MEDICINE SERIES. Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial Charge of Gustavus P. Head, M. D., Professor of Laryngology and Rhinology, Chicago Post-Graduate Medical School. Volume 4. Gynecology. Edited by Emilius C. Dudley, A. M., M. D., Professor of Gynecology, Northwestern University Medical School; Gynecologist to St. Luke's and Wesley Hospitals, Chicago. And C. von Bachelie, M. S., M. D., Assistant Professor of Obstetrics, Chicago Policlinic and College of Physicians and Surgeons; Gynecologist to the German Hospital, Chicago. Series 1909. Chicago, The Year Book Publishers, 40 Dearborn Street.

THE PREVENTION AND TREATMENT OF ABORTION. By Frederick J. Taussig, A. B., M. D., Lecturer in Gynecology, Medical Department, Washington University; Obstetrician to the St. Louis Maternity Hospital; Gynecologist to the St. Louis Skin and Cancer Hospital; Fellow of the American Gynecological Society, and American Association of Anatomists. Fifty-nine Illustrations. St. Louis. C. V. Mosby Company. 1910.

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EDITORIAL.

AN EXPOSITOR OF FATIGUE-TOXINS.

According to Sir Lauder Brunton, who has recently published a paper* in *The Practitioner* on the important subject of being tired, the world should be more lenient in its judgment towards those who have hitherto invited rather severe criticism on account of their tendency to stoop, to shuffle their gait, and their rebellious front in the face of exactions demanded by their more active friends. Instead of the condition being one of indifference and stubbornness, of condemnatory sluggishness and indolence,—in short, of laziness, with all its despicable attributes, it is in all truth not to be lightly thought of; for though the intent to work may be straightforward and honest, the omnipresent toxins will frustrate at times our best endeavors: even those of the superlative human creatures who are quite rampant in praise of themselves, when it is a question of their own superior activity. A trite and threadbare and time-honored saying has it that “all things come to him who waits,” and we hasten to add that at last the lazy man has come into his own by means of the semblance of an apotheosis which the Englishman cheerfully grants him. No longer will it be permissible for him, who is bristling with superabundant activity, to point the finger of scorn at this special brand of offender; for though for the nonce dereliction from a high standard may be his most glaring guilt, there is no telling when the stern and uncompromising critic will be similarly affected. Thus we see that the sanity of some men’s words leads to happy results: to issues which make for fairness and unbiassedness when summing up the status of their fellowmen, and to consequences which will be loth to admit that only those workers, in the lay and medical world, who are ostentatiously active, are just critics of the layman whose one desire is to reduce the number of his

*On Being Tired. October, 1909.

working hours or the physician who finds it beyond his mental grasp to undergo eighteen hours of strenuousness, daily.

That fatigue-toxins, though unappreciated in the pre-scientific period of medical knowledge, have always played an important role in the human drama, is a fact that must throw considerable light on what has hitherto constituted the judgments visited by critics on their contemporaries; and were patience our best quality, it would not be at all uninteresting to read anew the lives of some of our great men, with this recent discovery as our guide. What corrected and illuminating lessons would not be ours were we to pore over Dr. Samuel Johnson's "Lives of the Poets," Thomas Moore's "Life of Byron," Lockhart's "Life of Scott," and even Boswell's "Life of Johnson," with the guiding stars ever before us that have come to us through the latter-day teachings of Metchnikoff's *bacillus lactici acidi*, W. Arbuthnot Lane's surgical attack on the large intestine following chronic constipation and toxemia, Mosso's experiments, with the tracings by Dr. Maggiora showing muscular fatigue, as set forth in his book "On Fatigue," and Griessbach's calculations of the sensibility of the skin by the two points of a pair of compasses! Instead of agreeing with the various biographers that a life was cut short by dissipation, that mental depression followed disappointed hopes, that physical inability was a fixed habit, and fatigue the natural resultant of too much exertion, we would be in a position to contradict; and though the pleasure of reading would be interfered with; the medical mind, at least, would know the truth of the portrait. And since nowadays scientific values must not be underestimated, even though their correlation with quite distant matters is not at first apparent, the medical mind, cast as it is in the modern mould, would be the fitting and proper medium by which the chaff could be separated from the grain—the adventitious and obscuring intent and talent and exalted purpose of the individual from his natural obsessions—muscle and intestinal toxins.

The main current of interest, however, in Sir Lauder Brunton's article concerns itself with "the tired feeling" which has been recognized by all brain workers from time out of mind. Who has not felt weary and incapacitated for work after arduous labors in his appointed province, and given distressing indications that one more iota would be met by the rebellious spirit that invariably calls forth deep and lasting censure from members in one's own family? To abet the capacity for additional work, though there be a condition of brain anemia, and, incidentally, to set oneself right in the opinion of those whose critical attitude is most unjust, Sir Lauder offers a suggestion that is so simple that only the frivolous would deem it too scientific to follow. How he

came about discovering how best to combat his own brain weariness when a demand for work of a peremptory nature had to be met, must be told in his own words: "Many years ago I used to write for a medical periodical. On returning home one day, after a very heavy day's work at the hospital, and feeling completely exhausted, I found a note from the editor, 'Please let me have an article on such and such a subject to-night.' I sat down with pen and paper before me, but not a word could I write. Then I lay back lazily, and began to speculate as to the cause of my want of ideas. I thought 'the brain is the same as it was yesterday, but yesterday I was not tired; perhaps it is the feebleness of circulation that prevents the brain from acting. If the blood does not go up to the brain, I may bring the brain down to the blood.' I therefore placed my head flat on the table, looking sideways at the paper, and began to write easily. On raising my head again every idea fled, so I placed my head again down on the table, and finished the article with my head in that position."

But what Sir Lauder does not add is whether the article was good or indifferent; whether the editor of the medical journal was cognizant of the unusual performance and therefore lenient to its shortcomings; and whether the oculist, who examined his eyes after repeated efforts at writing in the position so graphically described, warned his patient to desist from future undertakings. Of course, the brain was properly fed, of that we are sure; but though Sir Lauder's words are not to be lightly passed over and though in substantiation of the great good that accrues from this position, we have the case of Lecky, the historian, who wrote—and now we are quoting the author again—"all his works * * * kneeling on a sofa which had a large broad head to it [and which] served him for a writing table whilst in the kneeling position," we are not completely won over by the suggestion. Certainly our sense of humor, and, if not ours, that of our immediate entourage, would make mock of us for indulging in this sort of abnormality during literary work; and knowing how alert even our best friends are to detect in our make-up the slightest suggestion that would justify the Byronic quotation "I told you so" at a later day, when a change in our dispositions occurs, a great quota of courage and a splendid defiance of written rules would be necessary to withstand all withering criticism. Fortunately, we are not all Bruntons or Leckys; therefore, our complacency as to what the laughter of others might do to the even tenor of our rather uninteresting lives need not greatly disturb us.

Another assailant of those unconventional rules which by now are part and parcel of our daily lives, is Mr. W. Arbuthnot Lane. According

to the illuminating lesson contained in his latest lucubration* on the subject which for months has been uppermost in his mind, namely, chronic constipation and toxemia, we, whose pride it has been for centuries to walk erect, must be classed with the abject ignorant, since our lackadaisical tendencies, our listlessness, our cold indifference, our melancholy, arise from the erect posture. This foolishly-approved manner of holding the body is responsible for a deplorable condition of constipation that is brought on by the weight of the abdominal viscera on that most sensitive, recalcitrant, and vindictive intestinal section—the colon. But chronic constipation, though rather an undesirable adjunct to our content and happiness, is not the only untoward feature in a pathologic condition that our superb ignorance is daily fostering. The idolator of the cult of the mischievousness of the colon goes much further and asserts, without the unnecessary circumlocution so apparent in the less scientific, that the clogged colon, true to its quality of unreasoning wrath on account of being housed in bodies ignorantly neglectful of its well-being, turns maliciously on the most vital parts in every man's and woman's existence—the sexual organs—and gleefully deprives them of their much-desired powers. In lieu of a case in his own clinic to substantiate his statement, Mr. Arbuthnot Lane falls back on one of Mr. Kipling's most popular novels, to-wit: "The Light that Failed," wherein the novelist pictures the heroine as without passion for the hero, though the latter is most ardent, but which Mr. Lane explains as nothing less than the ubiquitous colon, maddened by a diet of weak tea and toast—the heroine was an artist—turning on the sexual organs and paralyzing them!

Thus in these two pictures which the two Englishmen have kindly drawn for our enlightenment we see, that despite our customary vaunt of how to manage matters, in a civilized sense, we are just as defective as would be the illiterate and the non-reflective. We really do not know the harmfulness of the upright position whether it is a matter of mental exertion or the conservation of colonic integrity. We are discouragingly primitive, childish, and were we at all interested in the welfare of our bodies and minds, we would crawl on all fours. This might be taken as a return to Nature with distinctive signs of animality, but if it really has this stigma, it has much in the way of compensation; for by acquiring the habits so enthusiastically advocated by both observers, editors of medical journals would no longer fret and fume for "copy," and the large intestine would take on the behavior of all well-conducted organs.

*Civilization in Relation to the Abdominal Viscera. with Remarks on the Corset. *Lancet*, November 13, 1909.

FROGMARCHING AND FORCIBLE FEEDING.

An indication of the unrest of the times is the movement which has for its object the freeing of all womankind from the disabilities which the stronger entity in society, man, has not been at all unwilling to abet for the sake of a clearer line of demarcation between the sexes. This is no grave charge against the male contingent, but merely shows that the masculine mind knows best how our social comity shall be preserved. But like unto the child who has been pampered with sweets for months, if not years, until a stronger diet is craved and, when not forthcoming, is ruthlessly demanded, the woman of to-day deems it quite proper to use loud tones in the hope of having her political and social desires understood. Noise invariably attracts attention, and no nation should have a better conception of its glorious results than the American, for without it, we fear, many a successful man of to-day would not be successful, thus illustrating beyond a doubt the disadvantages of modesty. But though the permissibility of this is never questioned in the marts of high commerce, its complexion is greatly changed for the worse, grows quite forbidding, when those, who have been nurtured in the minor arts of gentle voices and gentle manners, express a desire to imitate the many illustrations of loudness and braggadocio which are at their very doors. These remarks may be construed as too aggressively assertive on our part, and as an indication of complete sympathy with the woman question, but this was not our intention at all; in fact, our leanings are neither one way nor the other. What we wished to express was, that the spirit of the age is such that surprise should not be so very intense, when contemplating the advances we all are making towards a social condition that will not be remembered for its pacific qualities.

In England, where they call the militant members of the woman's movement, suffragettes, just as if they were already a drug to be used as a quieting potion for overheated imaginations, raucous tones are greatly affected to bring about certain reforms. But the effectuality of strident voices being still in the balance, a fresh means for attracting attention has lately been evolved; and what with the lay and medical press teeming with the pros and cons of the forcible feeding of female political delinquents temporarily housed in prison, it behooves us to take note of this very important matter, lest when the desire to imitate seizes our own womankind, we will be in a position of great incapability to cope with a dietetic vagary that requires for its correction the finesse of the diplomatic mind. To be forcibly fed is not one of the most alluring pictures to call up as a possibility in one's own career; for though our stomachs are removed quite a distance from our brains, there is so subtle a con-

nection between the two that even when food is forced upon us by persuasion alone—by the kindly offices of interfering mentors—we are apt to rebel. Here there would be a state of health that would not be vitiated by refractoriness, but how different are the mental and physical conditions when the individual is laboring under a political wrong that has small chance of being righted, and struggling in a firm grasp like unto a vise as a preparatory measure to the introduction of the oesophageal and nasal tubes! The partaking of a meal in these circumstances can hardly be called a pleasure, since there is a complete absence of mental peace to promote enjoyment, and what with this necessary tenet of physiology completely in abeyance, and a belligerency rampant against superior strength that desires the mastery of the situation, one can readily understand why the outcome should be mental distress and physical soreness on the part of the prisoner, and agitation of thought on the part of the public.

This extraordinary fight against the voluntary starvation of prisoners would appear to the majority of us as destructive enough of all those amenities which should pertain to relaxation at meal-time; but according to the English publication, *Votes for Women*, frogmarching was added as a method of properly conducting the political offenders to the improvised dining-room, where the necessary implements—the oesophageal and nasal tubes—were lying in wait to tickle their palates. The same paper, fearful lest its readers will fail to appreciate the beauties of this method, says: "For those who do not understand the meaning of the frog march, we may add that Miss Martin was seized by the arms and legs and carried head downwards from her cell to the doctor's room, her head bumping on the stone stairs." After reading this can we say aught but that Miss Martin was not in a condition of "physiological righteousness" to enjoy and digest her meal, though she may have passed into the same state of submissiveness from exhaustion which characterized our own early youth, when a like visitation was our share for insubordination to the behests of larger and stronger companions.

Being far removed from the actual scene of all these occurrences, we are not in a position either to agree with Sir Victor Horsley, who is decidedly denunciatory of what was perpetrated on Mrs. Leigh, another prisoner, or Dr. E. H. Helby, the Medical Officer, whose ingenuity was called into play in the exercise of compulsory feeding. But though, on account of this, we hesitate to ally ourselves with either side, we cannot refrain from expressing the thought that even though the tubes were successfully introduced, the nutrition which was effected was decidedly below par. It may have kept body and soul together, as the saying goes, but surely it did not keep mind and stomach in close enough sympathy to

effect an increase in the secretion of gastric juice. The sight or thought of food is currently believed to be the best stimulant for this special secretion, but in the case of the dietetic performances in the English prisons, will anyone contend that there was not an almost complete inhibition, due to the fact that real food was not visible and thought was too much occupied with politics to allow the brain to send encouraging and stimulating messages to the stomach?

AS TO PREVENTIVE MEDICINE.

One of the dominating facts which should ever be kept in the medical mind is the indisputable one, that the public has become affrighted to such an extent, on account of the almost daily ventilation of preventable diseases in the lay press, that a proper appreciation of those diseases which can be prevented,—a clear line of demarcation between what diseases should be considered and what not,—is almost lost sight of. This is mentioned with considerable emphasis because, if we have read aright, the authors of the articles deem the coöperation of the public absolutely necessary to the carrying out of reforms which shall benefit all mankind. Here it would be well to pause and ask the questions, How can a public that has absolutely no training in scientific medicine be other than frightened, when certain truths are thrust upon it in such a way that they really amount to so many reprimands because scientific medicine has not been its best asset? and, Is fright the proper preparatory condition for a sane digestion which shall differentiate between what is momentous and what is unworthy of consideration? Psychologists who are so thoroughly wrapped up in other subjects should take note of this, lest some day, one, who is not so well versed in their science, will arise in our midst and proclaim a new discovery founded on the obvious failure of the education of the masses in the matter of preventable diseases.

It is in no spirit of frivolity that we approach so momentous a subject as that of how best to prevent the spread of disease. Education on the right lines would mean much, but to profit by it a preliminary induction into the intricacies of medical science is necessary. How many among us are valiant enough to undertake so thorough an education of the masses, that light would fall on all those darkneses which are cess-pools for the furthering of certain affections? And without this enlightenment can anything be gained? Can the physician hope for mastery of the problem, or even vanquish those prejudices which have been

encouraged by a very limited education until they are characteristics that refuse to listen to reason?

Of a truth, in the majority of cases, an insistent course of education would be met in so rebellious a spirit that the results would be far from heartening. But what would be most discouraging for the physician to contemplate would be the generating of fear in connection with all ailments, irrespective of their claims to gravity. While there may be some good in this, in as far as a fearful state is less foolhardy than a fearless one—hence, is less productive of harm to others, it has its obverse side as well,—a side that makes of the individual a being obsessed by the fixed idea that only through the cultivation of fear can a perfect state of health be achieved.

Physicians who are enthusiastic reformers are often purblind to the limitations of the public as to its knowledge of medicine. Though they may, before they don the magic mantle of him who goes amongst the people to instruct, be cognizant of the stubborn soil before them, directly they join the ranks of reformers their enthusiasm carries them off their feet, so to speak, and what they really see is only the necessity of a thorough appreciation of their lessons. This is not always forthcoming, but while others less ecstatic would be discouraged, their buoyancy never forsakes them. But, let it be said aloud, many of their wise words fail to take root, since there are more obstacles arising from a state of ignorance than these mariners in our uncharted social seas are willing to admit; and what with but a hazy comprehension of a medical subject, is it farfetched to conclude that the only outcome of all this earnestness is a feeble light, that struggles through the fuliginous darkness of a large number, and resolves itself into fear of the stern instructor, of themselves, and of all the people of their own class with whom they may come in contact?

Sanity—meaning the even balancing of things, the just estimate of their importance—is so necessary to the many instructions undertaken by physicians for the benefit of the lower strata of society, that its many absences can do naught but harm to the real worth of most movements which should be effectual in bringing about reforms. Our medical philosopher, who deserts his usual haunts and abides for a short space of time among the masses to give them a share of his knowledge and learning, is no longer the stern realist of the lecture-room or the sick-room, but an idealist whose beatific state is not in the least affected by sordid surroundings. No doubt, he knows quite thoroughly the subject he has in hand, but does he also know how impracticable many of his thinly-disguised scientific words are? Does he realize that coöperation is entirely out of the question where there are deep ignorance and want and

the sort of landlordism that is supposed to be absent in this country, but is really quite widespread? Does he ever think, after one of his seemingly effectual visits, that his injunctions, but partly understood, have either been entirely neglected, or are misconstrued into something that can make only for the further bemuddling of those who live in rooms in which the walls are not covered with jasper? For these are questions which assail us every time an article on preventable disease appears in a popular magazine over the alluring name of a physician who has dexterously slipped the medical noose, and who loiters in literary paths of dalliance for the edification of the lower classes, who have neither the time, nor money, nor inclination, to read.

LITERARY NOTES.

In their new work, "*Les maladies mentales dans l'armée française*," Drs. Antheaume and Mignot show that, contrary to accepted opinion, mental diseases, as evidenced in the French army, are more frequent than French critics are willing to admit. The disturbances oftenest observed among foot-soldiers are psychoses synchronizing with attacks of mental exhaustion. The sudden change from comparative comfort to an existence imbued with all the rigors of military discipline, not to mention the exactions incident to enforced physical and mental exertion, entails something more than the ordinary soldier possesses, namely, the sort of adaptability one associates only with men who are habitually in possession of normal intellectuality. One can readily see that since the individuality of the ordinary soldier is none too strong, he will not be long in manifesting insanity, should there be a predisposition to cerebral disturbances: a deplorable condition that is brought on partly by the officers in charge of regiments, who seem to see in his lack of ability to submit to stringent military rules, only what is perverse in human nature that must be corrected by increased discipline. Thus stubbornness is held responsible for insubordination, disregard of military rules, and open rebellion, when alienation should be regarded as the prime cause. This is particularly true in certain special corps—foreign legions, for instance—in which the mental state of quite a number of soldiers approaches a degenerate condition. General paralysis is said to occur as often as 63 times in every 100 cases of insanity among officers, and its great danger lies in the fact that it may remain unrecognized for some time. To illustrate, a captain of artillery, who was held in thrall by delirious ideas which had not been remarked by his associates, hurled himself against a stone pier whilst galloping at the head of his battery, and on another occasion had the cannon mounted in places so difficult of access, that it required consider-

able maneuvering, on the part of the gunners, to fire them. All of which shows, beyond a doubt, how important it is to eliminate from an army those who are mentally unbalanced, directly the first symptoms are noticed. To effect so drastic a measure a corps of expert alienists would be required, and that Drs. Antheaume and Mignot are in a position to know what remedy should be applied to present defects will not be doubted, when it is recalled that they are at the head of the state lunatic asylum at Charenton, which houses all the officers and soldiers afflicted with mental diseases.

DR. AUDRY, co-author with Drs. Durand and Nicholas, of the recently published "*Manuel de traitement des maladies cutanées et vénériennes*" (Paris: J. B. Baillière), gives some interesting details on the subject of the hair-dyes peculiar to the Renaissance, when blonde hair and dark eyebrows were the vogue. His account follows closely a similar chapter in Rodocanachi's "*Italian Women during the Renaissance*," in which two recipes for coloring the hair by the great Catarina Sforza have the place of honor. That these fairly bristle with complications need not be emphasized here. The first consists of four ounces of centaury, one pound of tartrate of alum, two ounces of oriental water-cress, one ounce each of sulphate of alum and potash, and seven litres of well-water. This mixture was poured into a cask provided with a bung-hole. After the quantity of water had been reduced to about one-third of the original amount by standing for some time, it was drawn off in its filtered state through the bung-hole. Before using the dye the hair was thoroughly washed and dried in the sun. The other recipe reads as follows: Wash the hair with a watery infusion of the ashes of the decorticated beech-tree, or better still, of the roots of the walnut-tree. If the latter is used, collect the water as it falls from the head in a receptacle in which there is a small quantity of wine; reduce the quantity to one-seventh by covering whilst boiling. Keep the liquid one year before using it. Still another recipe was prepared in this way: Macerate lupine for two hours in very hot water; rub the hair with this electuary and after combing it dry, it will be found to be very blonde. At Venice the women devoted many hours, once or twice a week, to the dyeing of their hair. Seated in the balconies of the houses they were wont to dye their hair with a sponge attached to the end of a stick, the necessary mirror at hand, in full view of the passers-by; or, in case they desired greater privacy, they resorted to the small square structures on the roofs, which were specially used for this important undertaking. After the dye was applied, a straw hat was placed upon the head as a protective measure against the sun's rays, the hair being thrown over the top of the hat and exposed all afternoon, even at the height of summer; for the idea was that the heat of the sun would effect a blonde color approaching the natural tint.

ORIGINAL ARTICLES.

ADRENAL THERAPY.*

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To make it possible to define with any degree of scientific accuracy the therapeutic use of adrenal preparations, the actual purpose or function of the adrenal secretion in the organism should be known. Oliver and Schäfer have shown that this secretion, as represented by adrenal extracts, raises the blood-pressure by increasing the tone of the vascular and cardiac muscles, but this familiar effect can no more be considered as the function of the adrenals than the production of glycosuria or arterial sclerosis by injections of adrenalin can be deemed such. Indeed, many other effects traceable directly to the adrenals have not even been, so far submitted to analysis. Oliver and Schäfer,¹ Reichert,² Morel,³ Lépine,⁴ and others, for instance, have observed that adrenal preparations caused a rise of temperature. As is well known also, excessive adrenal tissue development such as hypernephroma and interstitial adrenal hæmorrhage, may cause a rise of temperature quite sufficient at times to constitute a veritable hyperpyrexia.

The influence of the adrenals on metabolism is another phenomenon which physiologists have failed to explain. The rise of temperature produced by adrenal extractives was found by Reichert⁵ to coincide with increased metabolic activity. The controlling power of the adrenals themselves is likewise strikingly shown in malignant adrenal hypernephroma by the physical overgrowth it may cause, a child of five years attaining, in some instances, that of one of sixteen years, and showing, by its excessive appetite and other phenomena, that its cellular exchanges are being carried on at an inordinate rate. In fact Otto, Marchand and others pointed out nearly two decades ago that simple hyperplasia of the adrenals caused premature development.

Even the oldest coherent syndrome of adrenal origin, Addison's disease, stands before us as a mere catalogue of effects. We know that in virtue of the gradual loss of adrenal functions, there appear, in more or less rapid succession: asthenia, profound lassitude, digestive disturbances,

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dyspnoea, hurried and irregular action of the heart, anorexia, emaciation, bronzing, hypothermia, coldness of the surface, and, finally, as the precursors of death, delirium, coma and convulsions. These effects of gradual annihilation of the adrenals, through obstruction of their parenchyma or of their nerve paths, have remained quite as obscure, as to the manner in which they are produced and the function of the adrenals of which they denote the gradual extinction, as the phenomena of over-activity just reviewed.

It is plain that under these conditions it is impossible to analyze intelligently the therapeutic use of adrenal preparations, and it is because of this that I am obliged to treat the question from the standpoint of my own researches. I may add, however, that materially as my interpretation of the role of the adrenals in the economy differs from that of all other investigators, it explains the phenomena, experimental and clinical, they have all recorded, besides accounting for those to which they had not devoted their attention.

In 1903, I advanced the view that it was the adrenals which supplied the internal secretion that various physiologists, especially Bohr, had deemed necessary to account for the absorption of oxygen from the pulmonary air. Referring elsewhere⁶ for the complete chain of evidence in support of these facts, I will merely recall that while the adrenal secretion is endowed with a powerful affinity for oxygen, it can be traced at every step from the interior of the adrenals to the pulmonary air-cells to be taken up by the hæmoglobin molecule, and that it represents therein a constituent which physiologists had long recognized, but the identity and origin of which they had not shown.

The bio-chemic evidence all points to the correctness of this interpretation, even to the presence of the adrenal principle in the red corpuscles as a constituent of their hæmoglobin, which has been recently furnished by Mulon, of Paris. The presence of the adrenal product in the hæmoglobin, the blood plasma, the milk, the tissues, various secretions, the placental blood, the bronze patches of Addison's disease, further indicates that the adrenal principle is distributed to all parts of the organism and that the adrenal secretion is related with a general function besides that of pulmonary respiration, *i. e.*, tissue respiration or metabolism. This is quite in keeping with Howell's statement⁷ that "the physiological oxidations of the body cannot be separated from the general metabolic phenomena of the tissues."

On the whole, the adrenals carry on functions of the first order in the organism, from my viewpoint: *they are the source of the constituent of hæmoglobin which takes up the oxygen from the pulmonary air, to carry it to the tissues and sustain general oxidation therein, and also, therefore, metabolism and nutrition.*

If this brief outline of the purpose of the adrenals is clearly apprehended, the many physiological, pathological and pharmacological phenomena attributed to them or to their preparations can be readily ac-

counted for and explained. The rise of temperature noted by Schäfer, Reichert, Lépine and others, after the use of adrenal extract, is a normal outcome of the increased tissue oxidation it causes. The coincidence of the rise of temperature with increased metabolic activity noted by Reichert, is also readily explained, since oxidation and metabolism are inseparable processes. The familiar rise of blood pressure is itself but an expression of enhanced metabolism in the vascular muscles by direct and indirect action of the adrenal principle, the resulting contraction of the vessels being the cause of the rise of blood-pressure. While the slowing of the heart's action is the normal outcome of the increased resistance offered by the blood column, compensation is provided for by the increased vigor of cardiac contractions, caused, in part by the increased metabolic activity of which the heart muscle is also the seat.

As to the various pathological conditions of the adrenals enumerated, we can understand why hyperplasia of these organs, or the excess of adrenal tissue which constitutes hypernephroma, can, by enhancing inordinately their functional activity, raise markedly the temperature, and even provoke the hyperpyrexia occasionally observed. The influence of the adrenals on metabolism and nutrition also accounts for the surprising overgrowth and premature development in children afflicted with malignant hypernephroma, a condition in which the adrenal tissue is greatly, and sometimes enormously, in excess.

Conversely, we have in Addison's disease, with this conception of the physiological function of the adrenals before us, a typical example of gradual cessation of the vital functions, oxidation, metabolism and nutrition. The progressive muscular weakness and asthenia betoken pointedly lowered metabolism, while the hypothermia as clearly indicates reduced oxidation, and the emaciation inadequate nutrition. So great is the vital process *per se* undermined, in fact, that, as observed by Rolleston⁸ these cases sometimes emit a cadaverous odor. The bronzing itself testifies in this direction, since it denotes increasing loss of tone of the pre-capillary arteries, in keeping with a similar condition of the entire arterial system, and stagnation of the blood-plasma in the cutaneous capillaries. Indeed, Boinet⁹ and Mühlmann¹⁰ have shown that the bronze pigment actually consists of the adrenal product—which becomes brown or even black on exposure to the air.

All the phenomena that follow extirpation of both adrenals also become self-evident. The temperature steadily recedes, evidence that general oxygenation is progressively decreasing; the blood pressure is gradually lowered, in keeping both with the cardiac pulsations which become almost imperceptible, and with the general muscular weakness which becomes such that the animal can no longer stand. These phenomena clearly emphasize the interrelationship that exists between oxygenation and tissue metabolism, arrest of the one involving cessation of the other. The frequent though shallow respirations and the cyanosis afford indirect evidence of gradual respiratory failure while the rapid onset of coma, some-

times lapsing into convulsions, soon followed by death, exemplifies the all-important utility of the adrenals in the vital process.

With this conception of the physiological purpose of the adrenals before us, it becomes possible, it seems to me, to interpret the therapeutic application of adrenal preparations rationally, that is to say with a more precise understanding of their mode of action than heretofore. The disorders in which adrenal preparations are indicated can be divided into four general classes: (1) those in which they compensate for functional incompetence of the adrenals; (2) those in which they restore the cardiovascular equilibrium; (3) those in which they restore the respiratory equilibrium in the lungs and tissues, *i. e.*, the vital process itself; (4) those in which they promote the efficiency of the immunizing process.

Diseases in which adrenal preparations compensate for functional incompetence of the adrenals. The disorder which stands foremost in this connection is, of course, Addison's disease. The history of the therapeutic use of adrenal preparations, to which I will add grafting of adrenal tissue, illustrates clearly the disadvantages, nay the dangers, of the tentative use of any remedy without a clearly defined conception of its physiological action. Out of 120 cases treated by means of adrenal preparations or grafting found in literature, about 40 per cent. showed little or no improvement, 30 per cent. were markedly improved, and 20 per cent. obtained permanent benefit—up to the time at least the reports were made. This is not a bad showing for any remedial agent; but could we not, with the functions of the adrenals as I have outlined them, hope to increase the proportion of recoveries? Suggestive in this connection is the fact that with the adrenals as the primary organs in oxygenation and metabolism, the cause of the deaths that have occurred under the use of adrenal preparations or grafting can be clearly recognized, and therefore, guarded against in the future. Courmont,¹¹ for example, refers to "formidable hyperthermia" and prompt death after grafting dog's adrenals in advanced cases of Addison's disease. When we recall that Schäfer,¹² judging from the action of adrenal preparations on the blood-pressure, states that "in order to produce a maximal effect, a dose of not more than fourteen millionths of a grain of the active material per kilo of body-weight is all that is necessary," we can readily understand, in the light of my views, how the products of two entire fresh adrenals grafted into the tissues, could produce the "formidable" rise of temperature observed, and death.

The lesson to be derived from these lamentable instances is that the quantity of adrenal substance grafted or the dose of adrenal preparation administered must be carefully adjusted to the needs of *each* patient. This is further emphasized by the fact that the extent to which the adrenals are destroyed, or are rendered insufficient through disease of their extrinsic nerves, varies with each case, a mere vestige of adrenal tissue sustaining the general oxidations in the one, while considerable adrenal tissue is still functionally active in the other. Extremes in this

connection are well shown in two of the cases that were materially benefited; in one of these, reported by Bate¹³ but 1-12 grain (0.005 gm.) of adrenal extract thrice daily sufficed; in the other, reported by Suckling,¹⁴ a daily dose of 10 grains (0.01 gm.) had gradually to be increased until 175 grains (11.4 gms.) were given daily. On the whole, the one great fact emphasized is that adrenal preparations should never be used empirically in Addison's disease, and that in view of the direct role the adrenals play in the oxidation processes, the *temperature* of the patient, with his blood pressure as control (we have seen that they run parallel), should be taken as guide.

Inadequate action of the adrenals occurs in other diseases to which reference will be made in a subsequent heading.

Diseases in which adrenal preparations enhance the cardio-vascular equilibrium, and metabolism. Kothe,¹⁵ Rothschild,¹⁶ Crile,¹⁷ and others have obtained prompt recovery (after all other means had failed in Kothe's cases) in surgical heart failure from intravenous injection of adrenalin in saline solution. Mankowsky,¹⁸ Bates,¹⁹ Floersheim,²⁰ Deeks,²¹ and Boy-Teissier²² have urged the value of adrenal preparations in cardiac disorders accompanied by weakness, particularly when there is dilatation, cyanosis or oedema. Here, two distinct, though concurrent and mutually helpful, effects of the adrenal principle prevail in so far as the heart is concerned.

In 1853 Brown-Séquard²³ found that the venous blood of the venæ cavæ contained some substance which contributed to the contractions of the heart. A contemporary promptly relegated this experimental fact to oblivion by showing that carbonic acid, the only excitant credited to venous blood, failed to cause an exposed heart to contract. Had it not been for this misdirected experiment and the readiness with which physiologists accepted the experimenter's verdict, it is probable that Brown-Séquard over fifty years before Oliver and Schäfer, would have discovered that, in Schäfer's words,²⁴ the adrenal extract produced "a powerful physiological action upon the muscular system in general, but especially upon the muscular walls of the blood vessels, and the muscular wall of the heart." He would then, moreover, have reached the obvious conclusion, to which I was subsequently led, that inasmuch as the adrenal secretion passed by way of the adrenal veins to the inferior vena cava, it was inevitably carried to the right heart in the blood of this great channel, and that it was the adrenal secretion, therefore, which helped the heart to contract.

This explains the beneficial influence of adrenal preparations in heart failure and in chronic heart disorders of an adynamic type. Their active principle ultimately reaches the venæ cavæ and excites *directly* the muscular elements of the right heart. Besides this, however, the entire cardiac muscle is also, from my viewpoint, excited *indirectly*. The adrenal active principle being carried by the venous blood from the heart to the pulmonary air-cells, it is added to that already in the blood, and becomes

converted into the albuminous constituent of hæmoglobin, which, as we have seen, sustains oxidation. In this form it returns from the lungs to the left ventricle with the arterial blood it has enriched, to be distributed to the body at large. When we recall that the first arteries given off by the aorta are the coronaries, whose branches supply the heart muscle proper, it becomes evident that the entire heart is the first to receive blood freshly laden with oxygen. On the whole the adrenal secretion itself contributes to the heart's working power in two ways: (1) by enhancing directly the contractile power of its right ventricle and (2) by sustaining oxidation and metabolism of the entire cardiac muscle.

Emphasis must be laid upon an important practical fact in this connection, namely: that the obvious purpose of the direct aid the right ventricle receives from the adrenal secretion is to assist the walls of this ventricle in projecting the venous blood into the lungs. This explains the rapidity with which cardiac dyspnœa is relieved by adrenal preparations; they not only restore to the right ventricle its power to drive the venous blood adequately to the air-cells, but they supply it with the pabulum which enables it to absorb from the air enough oxygen to restore the general respiratory equilibrium. The increased metabolic activity in the vascular muscles being also enhanced, passive oedema is also caused to disappear, while the dilated heart tends to resume its normal dimensions.

The asthma of cardio-vascular adynamia, often met in elderly subjects, is promptly relieved in the manner just described, but this applies also to true asthma, as shown by S. Solis-Cohen.²⁵ This result is explained, from my viewpoint, not only by the increased oxygen intake and the improved tissue oxidation just mentioned, but also by the more perfect hydrolysis of the toxic wastes to which the spasm of the bronchial muscles, and therefore the asthmatic paroxysms, are due.

Diseases in which adrenal preparations restore the respiratory equilibrium in the lungs and tissues, i. e., the vital process itself. This refers mainly to an important feature of the problem, to-wit, the participation of the whole organism in the improved oxygenation. The prompt arrest of a paroxysm of asthma by the hypodermic injection of five to ten drops of the 1-1000 solution of adrenalin chloride for example, has been termed "inexplicable" and "marvelous;" but if the adrenal principle is considered as the active factor in general oxidation, and it is recalled that according to Takamine, one to two hundred thousandth of a grain of adrenalin (and this applies as well to other adrenal principles such as suprarenalin, epinephrin, etc.) suffices to awaken physiological action, one can readily understand why many times this dose will produce therapeutic effects. Especially does this assert itself when we take into account a fact I have long urged, to-wit, that we must look upon the active principle of the adrenal secretion, not merely as a reducing agent, but as a *catalyzer* which, though remaining itself stable, can take up oxygen and transfer it with extreme rapidity and in relatively enormous quantities,

to the hæmoglobin, and from this compound to the tissue cells. The adrenal active principle has not only been found in the red corpuscles by Mulon, as we have seen, but its catalytic action, first pointed out by Poehl, meets precisely the conditions deemed necessary by Moritz Traube in 1858, to explain the massing of oxygen in the tissue-cells necessary to normal metabolism. The prompt relief afforded by the adrenal active principle in asthma is thus due mainly to the fact that it suddenly and greatly increases not only the oxygen intake, but also the oxygen supplied to the tissue-cells through its all-powerful catalytic action.

Though apparently remote, pathogenically, from the disorders just reviewed, shock offers an example of a disorder in which the adrenal principle restores both the cardio-vascular and the vital equilibrium. Crile,²⁶ as is well known, kept a decapitated dog alive ten and a half hours by the slow intravenous injection of a 1 to 50,000 or 100,000 solution of adrenalin in saline solution, but this can hardly be ascribed solely to the action of the adrenal extractive upon the blood-vessels, as is generally believed, since the same investigator resuscitated animals fifteen minutes after death, by the same treatment. Can we consistently conclude that it was merely by enhancing the tone and contractile power of the cardio-vascular muscles in these animals that life was restored? The process assumes a more logical aspect when we consider the adrenal principle besides the cardio-vascular stimulant it is known to be, as the constituent of hæmoglobin which sustains oxidation and metabolism in the organism at large. As such it played a direct part in restoring life itself in the tissues. Administered in warm saline solution, the animals actually received, as regards their biodynamism, what amounted virtually to artificial blood, and their tissue cells, including the cardio-vascular muscles, were able to resume their functional activity.

This accounts also for the beneficial action by various observers in disorders due to functional exhaustion, especially neurasthenia and in trophic disorders of the skeleton such as osteomalacia and rachitis, since the nutrition of all kinds of tissue is enhanced. Intimately connected with the catalytic action just mentioned are the local effect of adrenal extractives such as suprarenalin, adrenalin, etc., in the nose, the eye, the urethra, etc. When the active principle is applied to a mucous membrane, it awakens through this property, violent metabolic activity and contraction not only in its cellular elements, but also in the muscular coats of its arterioles. These minute vessels are constricted so violently that their lumina are practically obliterated, thus preventing the entrance of arterial blood into the already contracted tissues, and causing the familiar blanching. Its action in arresting the various forms of hæmorrhage, epistaxis, hæmatemesis, etc., where it can reach directly the bleeding surface is thus clearly accounted for.

A kindred action is that observed in hæmoptysis, which has been treated successfully with adrenalin by a few clinicians, after which the usual remedies had failed. The oral use of any adrenal principle is at

best uncertain. Others have reported successful results from the internal use of adrenal extract, 5 grains frequently repeated. The use of adrenal preparations in hæmoptysis appears dangerous, however, owing to the intense rise of blood-pressure they cause. They should be tried only, therefore, after the classic measures fail, 8 to 10 drops of the 1 to 1000 adrenalin solution in a drachm of saline solution being given subcutaneously.

Diseases in which adrenal preparations promote the efficiency of the immunizing process. This phase of the physiological action of adrenal preparations is represented by their influence on infectious diseases. Abelson and Langlois pointed out in 1891 that the adrenals neutralized or destroyed toxic products of muscular metabolism, while Charrin, Wybaux²⁷ and others have urged the protective rôle which the adrenals fulfill in general infections. My own investigations have not only sustained these conclusions, but they have shown that when, after passing the pulmonary air cells, the adrenal secretion becomes the oxidizing ferment of hæmoglobin, it combines with the thyro-parathyroid secretion and a tryptic ferment of pancreatic origin to form the familiar immunizing constituents of the blood. When, therefore, we add an adrenal active principle to the blood, we increase directly its immunizing activity. We also increase it indirectly, for inasmuch as it enhances oxidation and metabolism in all tissues, it does likewise in the structures which produce immunizing bodies.

This accounts, from my viewpoint, for the marked reduction in the mortality obtained by Hoddick²⁸ in cases of peritonitis following appendicitis accompanied by uncontrollable decline of the blood-pressure, cyanosis, and other evidences of collapse, and also in puerperal toxæmias, by the slow intravenous use of adrenalin in saline solution. Hoddick ascribes the lowering of the blood-pressure to paralysis of the vasomotor center; but as the toxæmia is the cause of this condition, an agent capable of counteracting both cause and effect is necessary. This is met by the adrenal principle. The influence of the saline solution in these cases must not be overlooked, however. Seven years ago²⁹ I urged that death was often due, in infectious and septic diseases, to the fact that the osmotic properties of the blood became deficient, and advised the use of saline solution from the onset of the disease. The great reduction in the mortality of pneumonia in the practice of men who have carried out this suggestion has demonstrated its value.

Important in this connection, however, is the fact that the use of adrenal extractives might prove more harmful than beneficial in sthenic cases, especially when the febrile process is very active and the blood-pressure high. The saline solution alone is indicated under such conditions. But when, as in Hoddick's cases, the blood-pressure is low and there is cyanosis, it is because the dangerous stage which the saline solution would have prevented has been allowed to come on. Here the addition of an adrenal principle to the saline solution is of distinct advantage,

precisely as it is in collapse due to other causes, while simultaneously enhancing the immunizing properties of the blood and thus counteracting the pathogenic agents.

The most striking influence of adrenal preparations on the immunizing process is illustrated by the beneficial action in the advanced stage of febrile infections, including the exanthemata and toxæmias. Exhausted through prolonged overactivity, the adrenals are unable, as they are in Addison's disease, to secrete enough of their product to satisfy the needs of the organism, and, besides, to sustain the immunizing processes to their full efficiency. Now, adrenal preparations have been found to counteract this evil trend. Hutinel, for example, found them of great value in the asthenic stage of scarlatina and measles. This applies also to the disorders such as diabetes mellitus, exophthalmic goiter and acromegaly in which the earlier stages are attended with marked general crethism and excessive oxidation. Here, also, as the infections and febrile toxæmias, the remedy is of signal help when the adrenals themselves have begun to fail; that is to say when the stage of prostration with low blood pressure, a compressible pulse, hypothermia, and a tendency to syncope, has been reached.

In pleuritic effusions, as shown by Sir James Barr, injections of the adrenal active principle, after evacuating the cavity, prevents further secretion. This method has been applied to effusions in other locations, the tunica vaginalis, peritoneum, etc. Here the physiological action of the remedy brings in all the features I have enumerated, besides preventing reaccumulation by reducing the permeability of the local capillaries. Hence the fact that in some of the cases reported, the general condition of the patient was also greatly improved.

Summary. The list of disorders in which adrenal preparations have been tried could be greatly extended, but I have limited myself to those in which their use has proven advantageous in the hands of a sufficiently large number of practitioners to warrant their being added to our trusted remedial agencies. Of these, a certain number may even be said, interpreted from my viewpoint, to exceed other means at our disposal in value. These are:

1. Addison's disease. In this affection adrenal preparations compensate for the deficiency of adrenal secretion, and therefore for deficient general oxidation, metabolism and nutrition. The dosage should be adjusted to the needs of each case. Beginning with 3 grains of the desiccated extract three times daily after meals, the dose should be gradually increased until the temperature and the blood pressure become normal, when the last dose should be maintained.

2. Surgical heart-failure, collapse from hemorrhage, shock, asphyxia and submersion. Here the adrenal active principle (suprarenalin, adrenalin, etc.), as a catalyser and a constituent of the hæmoglobin, promotes energetically the intake of the oxygen and its utilization by the tissue-cells, including the muscular elements of the cardio-vascular sys-

tem, and thus causes them to resume their vital activity. It should be very slowly administered intravenously, 5 minims of the 1-1000 solution to the pint of warm (105° F.) saline solution. In urgent cases, 10 drops of suprarenalin or adrenalin in one drachm of saline solution can be used instead, and repeated at intervals until the heart responds. Artificial respiration hastens its effects.

3. The toxæmias, including bacterial infections, surgical septicæmias, etc., when collapse threatens, especially when a persistently low blood-pressure, hypothermia, and cyanosis, are present. Besides enhancing pulmonary and tissue respiration, the adrenal principle, administered in the same way, enhances the efficiency of the immunizing process.

4. Capillary hæmorrhage from the pharyngeal, œsophageal, gastric or intestinal mucus membrane. The mastication of tablets of adrenal substance, or the oral use of powdered adrenal substance in 5 grain capsules arrests the flow, by causing active metabolism in the muscular elements of the arterioles of the mucosa and constriction of these vessels.

I may add to these a series of disorders in which adrenal preparations will probably prove of great value when sufficient evidence will warrant a final conclusion. These are:

1. Sthenic cardiac disorders with dilatation of the right ventricle, dyspnoea, and possibly cyanosis and œdema, owing to the direct action of the adrenal principle on the right ventricle and improved oxidation and metabolism in the cardio-vascular muscles and the tissues at large. Tablets of from $\frac{1}{2}$ to 2 grains of the desiccated gland can be taken after meals.

2. Asthma, to arrest the paroxysms, by augmenting the pulmonary and tissue intake of oxygen and the cardio-vascular propulsion of arterial blood. From five to ten minims of the 1-1000 solution of suprarenalin or adrenalin in one drachm of saline solution should be injected drop by drop into a superficial vein, or hypodermically.

3. To prevent the recurrence of serous effusions in the pleura, the peritoneum, the tunica vaginalis, etc., after aspiration, by reducing the permeability of the local capillaries and restoring the circulatory equilibrium. From eight minims to two drachms (according to the size of the cavity) of suprarenalin or adrenalin, in four times the quantity of saline solution, should be injected into the cavity.

4. In neuralgia or neuritis, applied to the cutaneous surface over the diseased area to produce ischæmia of the hyperæmic nerves and thus arrest the pain. One to two minims of a 1 to 1000 adrenalin ointment should be applied by inunction.

The doses advocated will appear small to many. I can only urge in explanation that the power of the adrenal principle, as shown by physiological chemists and my own investigations, is such that it should be used with the greatest circumspection. Several recently reported deaths from its use emphasize the need of precautions when employing the hypodermic intramuscular and intravenous methods. Their oral use is at best

unreliable. This does not apply to that of the gland itself, nor to the desiccated gland, one grain of which represents six grains of gland substance. These prove quite effective, though slowly in most instances, when the disorder or condition present actually involves the need of the adrenal principle, to enhance either the oxidizing power of the blood or its immunizing properties.

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ORCHITIC AND OVARIAN THERAPY.*

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In discussing organotherapy, one must necessarily justify his theory. Our medical education is based upon pathologic anatomy, as it has developed arduously in the last forty years, from observations on the sick-bed, post-mortem and animal experiments. Bare facts perceptible to the eye form the standards of the diseases known to us. The inflammatory, the sclerotic, the infiltrating processes are, so far, the only recognized standards of a diseased organ. Organotherapy is the pure product of clinical observations, its theories and conclusions are those of human logic with all the natural errors attached. The plus and minus in the functional output of an organ, not necessarily linked with hypertrophy, form so far its only tangible basis. Organic chemistry has not progressed far enough to substantiate it. It is so much easier to work and teach with perceptible factors, than to reason with so far unknown premises.

Cellular pathology was taken up by the profession with such great enthusiasm because it placed concrete, perspicuous notions in place of the vitalism. And now we observe in organotherapy a resurrection of the old doctrine of "*vita propria*" of the various organs. We fight with our organotherapy certain dyscrasias already advanced by Galen. While Claude Bernard was the first to advance the doctrine of internal secretion for liver and spleen, while he was teaching that every cell producing an external secretion has also an internal secretion, it is Brown-Sequard's merit to have applied this theory to the germinal glands. This idea naturally met a larger support in the profession, as the whole world was acquainted with the visible results of castration in man and animal, at least it thought it was. He, however, as so many after him, made the wrong conclusion that inasmuch as man is only sexually active in the prime of his life, loss of this activity causes senility of the rest of the body. Debility and senility could therefore be prevented and cured by introducing artificially the substance of this gland.

Still his theories were slowly accepted by the profession; physicians could not conceive the idea of internal secretion. Especially in Germany did this theory meet with great rebuff. It was called a revival of the crazy ideas advanced by the monks in the middle ages of their teachings pertaining to the sequelæ of the "*semen retentum*, the unsatisfied womb."

In the last fifteen years gynecologists, puzzled by the mysterious functions of the female sexual organs, took up the question of internal secretion more seriously; and we must confess it has given us a much better

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understanding of the woman's body. As the number of sexual glands in the female is much larger than that in men, ovaries, mammae and uterus, they proved a better object for observation.

All we know about the function of the ovaries, menstruation, the symptoms of pregnancy and change of life, about the mysteries of woman's life, is due to observations made by men. Although we have quite a number of women practicing, there are hardly more than two or three contributions to this subject from women. It seems strange that men would be able to bring forth valid statements about a woman's nature; still it remains a fact.

Otto Weininger, a German psychologist, made the statement that so far no pregnant woman has expressed her sensations either in a poem or in gynecological paper. "Mulier taceat de muliere," as Nietzsche says. We cannot overcome the difficulty; our present ideas about the internal secretion of the ovaries are one-sided.

Discussing internal secretion of ductless glands one has to recognize first, that there is only an hyper- and hyposecretion. It is plainly absurd to assume that any tissue of the human body produces a poison which might prove noxious to its host. Even the carcinoma does not produce such a poison. The fœtus in the womb creates no poison, it is not the placenta that causes eclamptic fits, but the woman's own system being overloaded by the parasitism of pregnancy. This parasite sometimes makes demands upon the maternal glands with internal secretion that are excessive.

Why does such an overburdening occur? Why does the thyroid gland in one case of pregnancy swell up, and not in others? Why does one woman menstruate during the first months of pregnancy, and why do whole families show this abnormality, while the majority of women do not? Why do two or three sisters in one family develop goiter after child-birth? All these irregularities are easily understood by the inferiority of one of the glands with internal secretion. Just as one woman has a better developed glandular tissue in her mammae than other women, ovaries and thyroid glands may vary in their functional output.

In regard to internal secretion, women are more highly organized than men. Their larger number of sexual glands; ovaries, uterus and mammae, counterbalances another group of glands whose main representatives are the suprarenal bodies.

There is still some discussion regarding the place the thyroid occupies in these two groups. As stated on another occasion, I take the thyroid as synergetic with the ovary. *Ovaries and thyroid on one hand, hold the balance with their antagonists, namely the suprarenal bodies.*

Women are physiologically subjected to greater changes in their metabolism than men, on account of the periodical changes, namely menstruation, pregnancy, birth and nursing.

This periodical tide occurs in such a way, that it reaches its highest point some time before menstruation. Without considering the causes

of this monthly periodicity, I will only point here, that its height is connected with an increased activity of the two groups of glands with internal secretion.

A quantitative disturbance in the output of any of these glands, is sufficient to explain the unbalanced metabolic changes without referring to a mystic toxic secretion.

These disturbances form the foundation of our organotherapy, it is the only causal therapy besides that of bacterial sera. Having in mind the complex nature of the internal secretions, the antagonism between the two composite groups of glands, we will readily understand that organotherapy helps in certain cases in a most surprising manner, while its use often has no effect whatever.

There is also some periodicity in the function of these glands in men, however it is so small that it is not perceived by the majority of men. The comparatively large amount of chemical work done by the woman's body physiologically during menstruation and pregnancy is what differentiates her from man and makes her unfit for many of the toils of men; and not the external sexual characteristics. It is easily understood that this physiological harmony of ductless glands might become disturbed by the inferiority of one of them. This gland might have been inferior from time of birth, or might become weakened by microbe infection.

In the thyroid it is the typhoid and influenza gerin and in testicles and ovaries the gonococcus is the most frequent cause. Such glands will not be able to respond in a normal way to the increased demand brought on by puberty, menstruation and pregnancy. Other substitutive glands will become hyperactive, hypertrophic; they themselves, or the inferior glands, will exhaust their force prematurely. The result will be, precipitated climax, dysmenorrhoe, persistence of lacteal secretion, and all the other metabolic diseases peculiar to women, such as Basedow, osteomalacia, etc.

Another thing absolutely necessary for the understanding of the germinal glands is the abolition of the old view adopted by Darwin, Weissmann, Moll, and others, namely, castration of the male animal makes it effeminate while that of the female renders it masculine.

Hegar, gynecologist in Freiburg, was probably the first to rebel against this false doctrine, "*Propter solum ovarium mulier est quod est*" Castration creates an intermediate type of sex. Rieger, Sellheim and Foges have helped to promulgate this new doctrine. *Castration brings forth an asexual type but does not lead to a change of sexual character.* All those phenomena observed after ovariectomy,—as masculine appearance of the face, growing of a chin beard, etc.,—are mere secondary attributes of sex, just the same as the changes at times noticed in the plumage of old hens. There are still a number of physicians who deny anything like climateric phenomena after removal of both ovaries or the uterus. To these men I might reply that one positive case proves more than ten negatives. That great master physician,

Nature, is always ready to repair the injuries inflicted by surgery. Whenever there is a loss of one of these glands, the disturbance becomes compensated sooner or later.

Another obstacle for rational sexual organotherapy may be seen in that even the highest organism is bisexual, according to our leading biologists. Each sex contains the properties of the other in a latent condition; they might become manifest when the principal germinal glands are removed in the prime of life. There are probably more intermediate sexual types than norms. I will only mention the historical reports of gynekomasts nursing their children. Most of the skeletons we cannot classify as male or female. A woman might have all secondary characteristics of female sex and still to a greater extent be masculine. These are the principles of our modern doctrine of inheritance.

Testicles as well as ovaries have a pronounced influence on the development of the body. The increased accumulation of fat after castration is well known. This becoming fat we notice in our castrated women also. It is no proof against this theory that every woman does not become fat after this operation. I have mentioned that most of our studies on sequelæ of the removal of the germinal glands were made on women. Although the testicles are much easier to get at, man strangely has refrained from removing them. The removal in hypertrophic prostate, some time ago en vogue, was not apt to enlighten us as it is done in old men.

The "decayed" ovary is quite popular in our city; the testicle is not yet in such a dilemma. The only work that takes up the male castrate and its somatic condition is that of Tandler and Gross, 1908.

These authors examined five Skopzen, a religious sect extending through a large part of Russia and Roumania. Castration of the young male is one of the rites of their religion. They had to go down to Roumania from Vienna in order to make their studies. They had to use strong political influence, had to spend money freely in order to get these men to submit to the examination.

The most prominent symptoms of the male castrate consists of the long-lasting immaturity of their organism; their bodies give "the impression of being chilled in their infantile form." Persistence of the epiphysian lines, beardless faces, were found generally. Only in advanced age a chin beard appears similar to that of woman in the menopause.

Have ovaries and testicles the same validity? Man who has a smaller number of sexual glands, shows, according to all reports, a greater defect than woman after castration. They do not constitute with absolute necessity what we term sex, still, as it seems, they must be present in order to give the individual the male or female character.

In both sexes we assume a certain grouping of these glands with internal secretion. Glands that are synergetic counterbalance another

group, their antagonists. In women the number of these glands is larger, and their correlations better studied. Loss or hyperactivity of one of these glands is not absolutely connected with a disturbance of the general metabolism, but may, as you know, lead to a definite symptom complex, to diseases as Basedow, osteomalacia, acromegalia, which nearly always is connected with amenorrhœa, cretinism, myxœdema.

The first disturbance in the equilibrium occurs in both sexes at the time of puberty. The establishment of all those properties, that we comprise by the name puberty, as well as those of the menopause, set in by leaps. They have recently and as I think justly been connected with the expiring function of the thymus. The female organism, which physiologically has a smaller number of blood cells, suffers from chlorosis. During pregnancy ovulation stops in most women, while mammæ and uterus become larger. These two organs are synergetic with ovaries and thyroid. The internal secretion of the uterus is still questioned. However we know that women with metritis may present all the symptoms of pregnancy.

We are familiar with the fact that in women with a myomatous uterus, when pregnant, the so-called early and subjective signs of pregnancy do not show until the fourth or fifth month. The breasts of women after childbirth swell up until the lochia set in. From the time of the appearance of the lochia a regular secretion of the mammæ begins. This is not an atrophy, as Halban of Vienna maintains, but an increased activity at the expense of the other sexual organs, mainly ovary and uterus.

Artificial hyperæmia of the mammæ is able to cure some cases of dysmenorrhœa. The sucking of the child creates after-pains, the activity of the breasts brings forth the involution of the uterus. Women complain of turgor in their breasts only in the so-called premenstrual stage. The energy of all the functions of the female organism reaches its maximum some days before the menstruation. As soon as this periodical time abates (Wellenthal) when the tonus of the blood vessels is diminished, becoming evident through the menstrual flow, the pains in the breasts cease. Castration stirs up in a great number of women the secretion of milk. Extract of thyroid has the same effect. Women operated with Porro nurse their children.

Whether presence of the testicles has any influence on the development of muscle power, has not yet been proved. On the other hand, we know very well that the rut puts the deer in such a war-like state that it even attacks men. The wedding garb of some male birds, snakes and fishes during the time of copulation is evidently the result of increased function of their male glands. From all that has been stated above it will be evident that both glands exert a specific sexual influence. What does the internal secretion of testicle and ovary consist of? Both glands furnish a product that is secreted outwardly, which does not become active before puberty and again slowly vanishes in

higher age. That of the testicle is secreted in larger quantities and is the product of the cells that line the seminal canals. The secretion of the ovary, the ovulum, preformed during intrauterine life, is only produced once a month. There are no exact observations pertaining to this phenomenon. The ovulum secreted once a month is the largest and highest organized cell known, while the spermatozoon secreted in large numbers presents one of the smallest cells. This phenomenon does not, however, constitute all of the functions of these glands. Both contain in their stroma special cells, the interstitial cells of the testicles with their characteristic crystalline deposits, the Renki crystals and the interstitial cells of the ovaries with their vacuoles or granules giving the fatty reaction and resembling the lutein cells. Both cells have been anatomically known for some time. However their significance was not understood so far. Pflueger, Waldeyer and other authors have described them as "Kornzellen, Markzellen," etc. Their proper interpretation as glandular cells, the idea of ovaries and testicles being interstitial cells of the ovaries with French authors. Limon was one of the first to point out that ovaries of the same animal species show differences in the quantity of the interstitial tissue. In women we find it most developed in the years just before puberty comes on and again during pregnancy. The largest display of lutein cells may be seen in certain cases of chorioepithelioma and hydatid mole. Contrary to all other authors, I have always pronounced that lutein cyst formation is the factor which regulates the character, the malignancy of this growth. In true malignant chorioepithelioma we do not find lutein proliferation.

You are all acquainted with the effects of the Roentgen rays upon the germinal glands. Fellner's experiments on animals show that irradiation of the ovaries in the first half of pregnancy is followed by a regression of pregnancy. Angel and Bouin have confirmed these findings, the x-rays produce degeneration of the follicular as well as of the secretory parenchyma. The male deer throws off his horns once a year and grows new ones. When the buck is castrated the horns are thrown off within six weeks, should he happen to have same regardless of the season. Instead of growing an antlered horn, he grows crippled horns. Game wardens who observed this phenomenon long ago call it a wig (*Perückengeweih*). This peculiarity is closely connected with the presence of the interstitial gland of the testicle. The Roentgen rays destroy only that part of the testicle that forms spermatozoa. This was proved by microscopic examinations. The buck treated this way was perfectly normal regarding the change of his horns.

These findings agree very well with our clinical experience; double gonorrhoeic epididymitis leads to sterility, but not to changes in the secondary sexual characteristics. On the other hand we observe that gonorrhoea of both adnexa brings on amenorrhoea, irregular menstruation and sterility, and may some years later lead to a precipitate climacterium. Thus we see our old clinical experience proven by animal experiments.

While it seems established that the interstitial gland of the testicle is an independent organ, we cannot as yet say the same of the ovary. The ripening of the follicle and formation of the corpus luteum, the interstitial gland and formation of lutein cells, seem, so far, to be two so closely connected procedures that one cannot take place without the other. Fraenkel in Breslau draws the conclusion from his experiments that the corpus luteum alone enables the nidation of the ovum, also regulates the continuation of pregnancy. Limon, also Wallart, believes that the ovary besides the corpus luteum contains an interstitial tissue that is composed of cells similar to the lutein cells. This interstitial tissue corresponds, according to Lamartine and other authors, on account of the similarity of cell shape, with the interstitial cells of the suprarenal bodies and also the Langerhans cell islands of the pancreas (Rebaudi).

It is doubtful whether the ovary is absolutely necessary for a continuation of pregnancy. There is a case reported in which pregnancy lasted 263 days after double ovariectomy.

Male and female genital glands contain two tissues differing in their validity, in their influence upon the somatic development. The exocrine product is of epithelial structure, while the epitheloid tissue, regulating the endocrine secretion proper, is to be derived from connective tissue, at least that which the lutein cells concern.

It is necessary to remember all these points when discussing organotherapy. Another important point, emphasized before is, *the sexual glands form only one link in a chain of equivalent glands, that co-operate, that may replace each other and that may possess from birth a varying strength.* Their double nature explains so far the opposite views of the authors in regard to the position of the sexual glands, whether they are synergetic or antagonistic, to the chief representative of internal secretion, the thyroid.

Passing now to the object proper of my paper orchitic and ovarian therapy, I have to state that I treat very few men, as I am a gynecologist. I therefore have no personal experience in orchitic therapy. I have mentioned that Brown-Sequard employed extracts of testicle on himself. In 1889, asepsis had not advanced to the standard of to-day. The injections were combined with many inconveniences, such as formation of abscesses, etc. Later on, Poehl, of Petersburg, an enthusiastic adherent of organotherapy, isolated the spermin from the testicles of horses and used it in a 4 per cent. alcoholic solution, the so-called *essentia spermini-Poehl*. Besides in the testicles, spermin occurs in other organs and also in the blood. It increases the activity of the heart. It is said to have a tonic effect upon the muscle power and the general condition of nervous and debilitated men. Poehl's followers have demonstrated, that spermin injections increase the alkalescency of the blood, produce leukocytosis, decrease blood pressure, in short spermin is antagonistic to adrenalin. There are a number of favorable reports at

hand from Russian and Italian authors. The preparation is expensive and has not therefore been used extensively. The injections are not painful and cause a pleasant sensation.

Baum, who voices the German authors (Eulenburg, Senator, Furbringer, Ewald), says Spermin has no specific effect, it is a physico-chemical agent which increases internal oxydation and regulates metabolism. This is the same opinion as already expressed by Poehl, who explained the effect of spermin as katalytic.

We are better versed in ovarian treatment. The greedy hand of the general surgeon has deprived many women of their ovaries. The ghost of the small cystic ovaries which, together with the useless repair of the unavoidable laceration in the vaginal portion during delivery, still dominates the field of surgery of women, has created the ovarian therapy. We are now at least somewhat enabled to save our women patients the dreaded phenomena of the sudden menopause.

There are perhaps four cases reported of Basedow setting in after removal of the ovaries. The actual number however is much larger, and still more frequently hyperthyroidism is observed thereafter. This was proved to me by cases reported at our meeting on November 17th. The scientific research of the result of useless operations is somewhat impeded by the spontaneous natural repair. Nature repairs in a few years the damage done by the clever surgeon. Other glands take up the work of those removed. The Emmett operation is often performed so thoroughly that a pin head opening is all that remains of the external os. This opening is sometimes directed towards the vagina; it can only be found with difficulty. It takes, sometimes, from six to eight months and even a year before nature adapts itself to this artificial hyperæmia, but finally the woman gets well and even praises her doctor.

Three large groups may be differentiated in ovarian therapy. 1. The removal of both ovaries. A scientific indication for removal is only to be seen in osteomalacia (tumors excepted). In the greater number of these cases this operation proves not only curative but life-saving. Some cases of grave hysteria have also been cured by double ovariectomy. I have observed such a case myself for a long time. In these cases the removal of the ovaries will naturally be the last resort, after everything else has failed.

The small cystic degeneration of the ovaries is probably often something physiologic. For the greater the number of pregnancies, the larger will be the number of atretic follicles. The post mortum of every puerpera reveals small cystic ovaries. In most of the women ovulation ceases during pregnancy. All the half-ripe follicles become atretic and cystic through the destruction and resorption of the ovum and its cells. The removal of the small cystic ovary, of an organ whose pathology consists of an impeded ripening of the follicle, is biologically the same as if you would remove the testicle from a man who suffers from azoospermia. You try to cure the impeded and insufficient function by removal

of the organ. Among the hundreds of cases reported, in our city also, some are to be found that show excellent results, patients who had consulted many doctors. In some of these successful cases a hypersecretion of the ovaries, or synergetic glands, might have existed. The removal reestablishes the disturbed harmony. Hypersecretion of the ovaries brings on osteomalacia and is cured by their removal. This, however, does not prove that osteomalacia is the only and unavoidable consequence of such changes in the internal secretion. The so-called neuralgia of the ovaries may also be cured by the removal of the ovaries but antipyrin injections have the same effect.

The second large group comprises the reimplantation of the ovary. We find about twenty-four such cases reported. The successful transplantation is, as you know, one of the fundamentals of the doctrine of internal secretion. It has taught us to discard all that chaos of trophic nerves. In contrast to the ovary, testicles cannot, apparently, be transplanted. Cevolotto's reports show again that the spermatoblasts perish in the transplanted testicle. We differentiate between autoplasmic transplantation, the implantation of the patient's own ovary in the pelvis or thigh, and heretero- or homoplasmic transplantation, the implantation of the ovary of another woman. When the transplantation has been successful, menstruation sets in within three to six months. Osteomalacic patients treated with removal and reimplantation improve up to the moment when the transplanted ovary takes up its function, until menstruation sets in. With that moment the old pains in the bones reappear, as Pankow's case demonstrates.

Autotransplantation has been performed mainly in order to spare women the much dreaded climacteric phenomena. Nothing embitters the enjoyment of successful gynecological operations more than the sequelæ of castration (Chrobak).

In the last ten years, we have learned to save some ovarian tissue, even when both ovaries are involved, in benign cystic tumors. Morris, of New York, has performed autotransplantation, chiefly in inflammatory diseases of the adnexa, and succeeded in avoiding the precipitate menopause. In dysmenorrhœa we cannot expect any help from reimplantation of the ovaries, as shown by Pankow's cases. In his cases patients were well until menstruation set in. Morris' results in dysmenorrhœa must probably be attributed to the loosening of many adhesions. In metritis with severe hemorrhage this operation was not successful either.

Homoplasmic transplantation has been done for operative, inborn (infantile uterus) and acquired amenorrhœa (lactation atrophy of the uterus). In four of these cases the patients became pregnant; two women aborted and two living children were born at term (case of Morris and Holliday Croom). This gave rise to the question whether the proprietress of the grafted ovary or the mother who carried the child is the real mother. As there as six to eight cases of pregnancy after double ovariectomy reported, this question cannot be decided without a renewed

autopsy in vivo. This somatic organotherapy will necessarily work better than the administration of the dead chemical product.

Before the transplantation of the ovary was successfully performed, some gynecologists conceived the idea of improving the clinically unsatisfactory results of panhysterectomy. Some of their operated patients remained invalids for a shorter or longer period. Chrobak, of Vienna, and Landau, of Berlin, tried the administration of ovarian substance. They used ovaries of the fresh killed hog, oophorin, ovarium. Ovaries of these animals are especially rich in interstitial parenchyma. Later on ovaries of cows were used (ovaraden). As oophorin has been in use since 1895, we are able to form an opinion about its value. It has established itself in our pharmacopœia. It is principally used in the precipitate as well as the physiologic amenorrhœa of the climacterium. Again and again we see most surprising results. The state of anxiety and the perspiration which accompany the hot flashes, disappear in a few days, and soon afterward the number and duration of the attacks are reduced. Women that had thirty to forty flashes a day return at the end of fourteen days and inform you they have now only one or two a day, and these are not connected with disagreeable sensations. A few days after you stop the medicine, the old complaints return.

In those nervous conditions which attend the amenorrhœa of gonorrhœo adnexitis, oophorin is of good service; also in the first months of pregnancy and, as a French author claims, in vomitus gravidarum. It does not bring on abortion even when given subcutaneously. Not every disturbance of the general health of a pregnant woman is caused by hypothyroidism, as most physicians assume.

Clinical experience has furthermore taught us that ovarian substance cures some cases of amenorrhœa. In most cases it is of no avail; indeed we have in the thyroid preparations a much better emenagogue, as emphasized already by Solis-Cohen. When treating amenorrhœa, we have to remember that ovulation and menstruation, although in same temporal connections, are two separate phenomena. Both phenomena cause the so-called periodicity in woman's life; still they are independent of each other. There are a number of cases reported of amenorrhœic women who become pregnant. There are women who never menstruated, that bore children. *Ovulation is an absolute requisite of impregnation, while menstruation is only a concomitant phenomenon that facilitates the nidation of the ovum; it is probably the product of a whole group of glands with internal secretion.* These glands are also influenced by other conditions, for instance meteorologic. In primitive races amenorrhœa is quite frequently found; according to Cook, many of the native women of Lapland menstruate only during summer time. Menstruation might in a single case even prove independent of the presence of the ovaries, as we observe occasionally in our operated women and as demonstrated very nicely by a case published recently by Gellhorn, of St. Louis. After a menopause of six months in the course of double ovariectomy, regular menstruation set in

after administration of oophorin, and disappeared again when the medication was discontinued.

According to Vander Velde, oophorin cures the so-called "Mittelschmerz," this intermenstrual pain that sometimes occurs at the height of the monthly effervescence of the generative organism in women. This same author succeeded in bringing forth the periodic tide, periodic changes in temperature and pulse and menstruation in women who were already one year and a half in their menopause, by the administration of oophorin. There are several cases on record in which ovarian extract has brought on menstruation in women who had regular monthly molimina but no menstrual flow.

All this demonstrates that ovarian substance given per os often proves the missing link in the chain of organs that create the monthly bloody discharge. So far we have explained the effect of this preparation as katalytic, recent examinations of adrenalin (Straub, Kretschmer) have made it very probable that the mechanism of its effect is analogous to that of muskarin (Reizgifte). It has to be given in a certain quantity in order to produce glycosuria. The English physiologist, Starling, has named these substances in contrast to nutritious matters, hormones. He succeeded in showing that extracts of an embryo injected into virgin animals, produce growth of the breast, just as if the animal were pregnant (mammæhormons). Some authors are already discussing ovarian hormones, that should bring on hyperæmia of the pelvic organs. This, however, is not yet an established fact.

Experiments on animals show us what effect ovarian substance given by mouth has on the general metabolism. It increases the gaseous metabolism without destruction of nitrogenous substance, as shown by Loewy, Richter, and many others. According to Mathes, it augments the output of phosphorus. Similar to spermin, it exerts a vaso-dilatory effect, in contrast to the vaso-constrictory adrenalin. Fraenkel, of Breslau, who advanced the corpus luteum theory, was instrumental in getting up lutein tablets, and it is claimed they have helped in some cases in which the oophorin was of no avail. I have no personal experience with it. We can justly conclude that ovarian substance enables us to influence the general metabolism in women. This influence becomes evident first *in the enlargement of the periodic tide which occurs physiologically in woman's life* and which manifests itself by a regular monthly bloody discharge from the genitalia in healthy women. Administration of ovarian substance sometimes brings forth menstruation, it increases the scanty flow and makes it more regular. Women thus treated, lose in weight, but not as much as when thyroid is given. *Secondly, it enables us to regulate the rapid decline of the periodical tide, which sometimes takes a very stormy course in the climacterium.* We thus give the organism time to adapt itself to the disturbed balance in the output of the internal glands, the natural consequence of the extinguished function of the ovary. Ovarian substance fed to animals or men is not able to prevent

the atrophy of the genital organs which sets in after castration. It is ovulation that keeps them in a reproductive condition.

Because ovariin brings on menstruation, it recently has been recommended in cases of infantile uterus and sterility (Bab), also in sexual frigidity. It reestablishes and regulates sometimes the periodicity in woman's life and could thus create a hyperæmia of the genital organs. All the drugs used in amenorrhœa are given with this intention. As these trials are of a very recent date, one cannot as yet form an opinion regarding them. *A periodical hyperæmia might improve the ripening and regulate the bursting of follicles, we might produce menstruation, but will not necessarily cure thereby the sterility.*

Physicians are still too ready to explain these good results of ovarian therapy with suggestion. It is hard to disprove this objection. What differentiates man mostly from plants and animals is our psyche. The higher susceptibility to all kinds of suggestions, not only the teachings of church and school, constitutes man's superiority. As long as the genus homo exists it will be subject to suggestions. The operations we perform have a greater suggestive influence on the human mind than the most learned physician. On the other hand, the man who makes a rational use of organotherapy is the last to deny the influence of psychic phenomena on these glands with internal secretion. Just as man becomes pale and perspires when in anguish, showing a nervous sympathy, our glands with internal secretion are susceptible to outside impression. It is well known that Basedow may set in after fright, that hysteria may be caused by a psychic injury, that the menstrual flow is suddenly suppressed.

The more a woman watches for her menstruation, the surer she is of missing it. How many times have we heard from our women patients, that sudden stoppage of menses was the beginning of her illness, of her female weakness. Man, in his superiority, cannot understand things like that. Being more robust by nature, having a smaller number of glands with endocrine secretion, whose functions are not subjected to periodical hyperactivities, man naturally is exempt from many of the psychic disturbances that effect women. We smile at our pregnant patients when they ask our opinion regarding prenatal influence. A child is not necessarily born with a birth-mark after such a psychic impression, but might otherwise be born inferior. As I have emphasized upon another occasion, the child's organism while in utero, adapts itself to that of the mother. The child of an eclamptic mother shows sometimes right after birth the same eclamptic convulsions; new-born girls now and then menstruate once or twice. *Their ovaries are not active, but the mother's periodicity reflects itself in her new-born daughter.* Children born of women whose internal glands do not act properly, develop rickets, exudative diathesis, Basedow, and are sickly.

There is no better proof of the influence of the psyche on the organs and the whole body than the existence of mental healing advocates, this

shrewd exploitation of the natural feebleness of human mind. It is a natural reaction against operations for small cystic ovaries, for tears of the cervix, for every little fibroid. The founder of such movements shows a better understanding of the psychical conditions that influence woman's organism than any of her sisters who follow the rules of men in mutilating women.

This might sound somewhat aggressive, still the obstetrician and gynecologist cannot help emphasizing the fact that the general surgeon sometimes forgets the highest principle in the art of healing, that is, *nil nocere*.

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TAXIS AND SUCCUSSION—A NEW TREATMENT FOR INTUSSUSCEPTION.

By JOHN ZAHORSKY, M. D., of St. Louis.

The treatment of intussusception, before the advent of aseptic surgery, may be learned from an article by Pilz (*Yahrb. f. Kinderheilk.*, 1870). He reported the result of various forms of treatment in 162 cases, of which 35 recovered and 129 died, showing a recovery rate of 20 per cent. Eight of these cases were cured by means of the rectal inflation of air, eight by the rectal injection of water, and five by the use of the rectal sound. This author rejected the older methods of treatment by calomel and metallic mercury. He found no benefit from the internal administration of sweet oil, opium, and other medicaments. He advocated the use of physical methods and laid special emphasis on the rectal insufflation of air, a procedure that dates back to Hippocrates. The rectal injection of water was also commended and he reported a few striking results. The rectal sound or tube was given a place in the armamentarium for reducing and invagination. He advised that the tip of an ordinary esophageal sound should be protected by a small sponge and this carefully pushed up the rectum. Only two cases had been treated by laparotomy at that time and both died.

In the prize essay on intussusception by Guthrie (*Practitioner*, 1906), the modern method of treatment and the results are given. From 1875 to 1887, at St. Thomas Hospital the rate of recoveries was about 25 per cent. From various sources it is learned that under prompt treatment by surgical operation the rate of recoveries has increased to 40 or 50 per cent. He advocates prompt operation as soon as the diagnosis is made and deprecates all attempts at mechanical reduction of the invagination.

The English surgeons especially have originated and improved this surgical treatment and the rate of recoveries in experienced hands has gradually increased. Clubbe, of Sidney, in his last 50 cases saved 38. (*British Med. Jour.*, January 17, 1905). Similar results were obtained by Cole, of Melbourne. Clubbe states that the rectal injections of warm oil or saline solution does away with the necessity of operation in 10 per cent. of the cases. Cole contrasts his rate of recoveries (73%) with that by rectal injections (46%).

The study of the results given by different surgeons shows that a mortality of 50 per cent. may be expected. Holt gives the mortality about 40 per cent. on the first and second days; after this time the death rate is very high.

The high mortality of the operation in infants and the consequent anxiety caused to parents by removal to the hospital and several days of

waiting, makes physicians hesitate to recommend the early laparotomy as long as there is a possible reduction by mechanical means. Clubbe succeeds only in 10 per cent. of the cases in reducing the invagination by the rectal injection of oil or saline solution. This contrasts rather sharply with the results of Hirschsprung (*Mitt. Grenz. Med. u. Chirurg.*, 1905), who reported over 100 cases, between 50 and 60 per cent. of which were cured by mechanical means.

The success of these mechanical procedures seems to vary greatly in the hands of different men, so that it is difficult to estimate the actual value of different methods. Fitz reports 33 cases out of 44 successful; while Wiggin had 23 failures in 39 cases. Barker failed to reduce the intussusception in every one of his cases by the rectal injection of water. Hand recently reported a successful case. In the study of these cases one is impressed by the fact that the technic used by different physicians is not the same and may in a great measure account for the difference in results.

It is clear, however, that the treatment by rectal injections is made more effective by the use of external manipulation or taxis. The signal success of Hirschsprung depends on the use of chloroform, rectal injection of water and taxis. While it is probably that he and his assistants have acquired a skill not possessed by the average practitioner, his success must necessarily dampen the practitioner's enthusiasm for prompt surgical intervention.

It is necessary to emphasize taxis as a valuable adjuvant to the rectal injections for the reduction of an intussusception. Guthrie, in the prize essay mentioned, declares that "external manipulation alone is scarcely worthy of consideration." Nevertheless, five of Hirschsprung's cases were reduced by this means alone. My own limited experience corroborates its extreme usefulness and it should always be employed with water injections.

Several years ago I devised a mechanical method of treatment which has served me well in two cases, and to which I desire to call attention at this time. I call it the "Combined Taxis and Succussion Method."

The technic is as follows:

The little patient is anesthetized with chloroform by an assistant. The abdomen is bared, and a small pillow should be placed under the hips. The tumor is grasped through the abdominal wall and firmly compressed for a few moments in order to reduce the swelling to some extent, since it is the hyperemia and edema that prevents reduction. Then the thighs are flexed on the abdomen, the knees or legs grasped, and with a rapid up and down movement the lower part of the trunk is vigorously shaken for several seconds. Then the tumor is grasped again and compressed, then pushed against any part of the posterior abdominal wall the fingers push, or strip, the intussusciens out of the intussusceptum. The fingers at the same time should make a trembling motion which assists in the reduction. After a few moments of taxis the succussion is again resumed.

The efforts of taxis and succussion follow each other alternately. The succussion method is very much assisted by the presence of some water in the transverse colon, which should be injected if reduction does not occur promptly.

I have successfully used this technic in two undoubted cases of intussusception, one of which I saw with Dr. W. L. Johnson, and the other with Dr. Albert E. Taussig. It is unnecessary at this time to recite the history

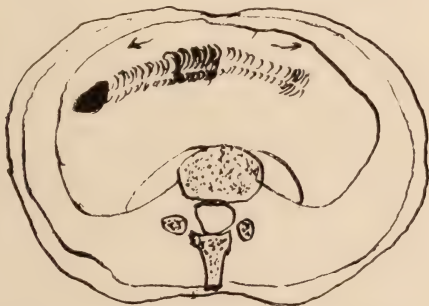


Fig. 1. The arrows show the direction of motion when descent of the body is suddenly stopped during succussion.

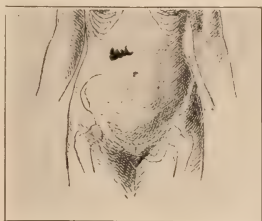


Fig. 2. When the intussusception is located near the median line (transverse colon), the succussion should be performed with patient on the back.



Fig. 3. When the intussusception is at the extreme side (ascending colon), the succussion is most effective with patient on the side.

of these cases. However, this success has convinced me that the method should be tried by others and it is for the purpose of calling attention to this harmless procedure that I make this preliminary report.

Of course, this procedure has its limitations. Success is probable only in early cases, hence the diagnosis should be promptly made. After 24 to 36 hours in acute cases the swelling will be so great and the local con-

striction so tight as to render reduction impossible by this method. In cases depending on some foreign body or abnormal growth success is very unlikely.

In conclusion, a few words on the value and mode of action of succussion may be interesting. In what way does succussion act?

That this shaking does do the work is evidenced by the fact that in both of my cases the tumors disappeared while the shaking was being done, although taxis had very much diminished the size of the swelling. The sudden jarring may loosen adhesions, but there is another explanation which I believe is the true one. To make this clear it is necessary to recall that the abdominal cavity has a high ridge running throughout its length when the child lies on its back. From this ridge, the spinal column, a marked declivity extends on each side. When any downward movement is suddenly arrested the resulting force is strongly outward (Fig. 1). If the invaginated mass is situated near the median line the afferent and efferent parts of the intestine have a tendency to go away from the center and thus pull the invagination apart. This is especially true if the tumor lies in the region of the transverse colon, which is the most common position (Fig. 2).

If the tumor mass lies on the extreme side, as in the common ileocecal variety, it is necessary to place the patient on the left side with the invaginated intestine up and then give the successive jars or shakings. The heavier tumor will have a greater momentum to swing toward the side and thus reduction might occur (Fig. 3). Whatever be the true explanation, succussion is a valuable addition to the mechanical methods of reducing intussusception, and I urge that the method be tried by others.

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SPECIAL ARTICLE.

EARLY RISING AFTER CHILDBIRTH.*

By DR. ROBERT MUELLERHEIM, Berlin, Germany.

Translated by DR. HUGO EHRENFEST.

Every obstetrician meets with cases in which diastasis of the recti muscles, retroflexion of the uterus, etc., develop, and this in spite of extreme care in the management of the puerperium. Rest, the use of a bandage and the employment of all known prophylactic measures, often cannot prevent those sequelæ of childbirth which always prove embarrassing to the attending physician. Of course, these occurrences should not be accepted as the unavoidable results of the limitations of human power, but must incite us to find better methods of treating the puerperal woman. The old regime of scanty and insufficient nourishment during a carefully watched and unduly prolonged period of bedrest has within the past few years lost its prestige. It has been recognized that it is not to the advantage of the normal and healthy woman to be kept for weeks lying in bed. The reduced activity of the heart and of all voluntary muscles thus obtained interferes with the proper distribution of the blood and impairs the function of all organs. At a time when the sitting posture still was considered "most unsuitable," even for women who had passed through such a prolonged bedrest, it certainly meant progress when Hegar advised gymnastic movements while the patient was still in bed. These movements consisted in attempts to raise the upper part of the body from the bed, at first with the help of the supporting arms, later without them. Hegar appreciated the necessity of correcting certain undesirable results of childbirth by active measures and gradually developed a therapy of exercise. If a rapidly expelled head has caused overstretching, or tearing of the levator ani or constrictor cunni, Hegar advised voluntary contractions of the perineal muscles. The patient is instructed to imitate, several times a day, the movements she makes when she tries to overcome the desire to defecate or urinate; and Thure Brandt in his book on the "Treatment of Gynecological Diseases," repeats these instructions almost verbatim. He suggests similar exercises for the purpose of

*From *Berliner klinische Wochenschrift*, 8 November, 1909.

strengthening the muscles of the pelvic floor, especially of the levator ani, in cases of descensus of the vaginal walls. Restoration is hastened by the following exercise, which closely resembles Hegar's suggestion: The stretched limbs are crossed over each other, the muscles of the buttocks contracted, and then, slowly, the sphincter ani contracted; thus the pelvic floor is raised.

Kuestner made another step forward by permitting patients to leave the bed a few days earlier than was customary. It is an every day experience that women, especially of the working class, rise from bed a day after childbirth and apparently suffer no ill effects. We know of the habit of certain savage people to rise immediately after expulsion of the child. A sudden fire in a maternity hospital in Switzerland drove all the puerperæ, including the very recently delivered ones out of their beds. Some of the inmates ran to the top floor to save their belongings; yet not one seemed to have been harmed by this experience. Indeed, for many years it has been the practice to place seriously sick people, if of advanced age or if exhibiting symptoms of bronchitis after operation, in a sitting posture as soon as possible, often to put them in comfortable chairs to avoid hypostatic pneumonia. We can assume that considerations of this sort guided Kuestner thirty years ago when he began to experiment with early rising after birth. To the question, is a normal puerpera benefited by prolonged bed-rest? he finally formulated the following answer: Early rising does not harm her; it does not cause fever; it does not result in prolapse or retroflexion. Indeed, such a procedure proves advantageous because it hastens the involution of the uterus, favors defecation, and enables the woman to urinate spontaneously, thus obviating catheterization and overdistension of the bladder, the latter an important etiologic factor in the causation of descensus of the vagina. The chief advantage of early rising, however, consists in the early use of all the muscles, which stimulates cardiac action and circulation.

Kuestner selected the patients for these clinical experiments with great care. He excluded those in whom the perineum, vagina or cervix had been torn during birth, those who had an elevated temperature presumably due to infection, who had an acute gonorrhea, and those who either had been delivered by means of an operation, or had passed through a long and tedious though spontaneous labor. The patients usually left the bed on the third and fourth day; some, however, arose on the second day, at first for a few hours only, and gradually increasing the time until the fifth, sixth or seventh day they were out of bed all day. They wore a T-bandage and themselves attended to their children. If labor had been managed by a physician and the patient remained under that physician's observation, Kuestner considered this therapy of the puerperium well adapted also for private practice. Methods like early rising which imply convenience and saving usually are readily accepted by the public and by the large maternities, which are always much overcrowded. For these

and other reasons several German clinics were induced to test Kuestner's suggestions during the last decade.

From Bumm's Clinic of the Royal Charité (in Berlin) E. Martin, jr., recently reported that women were permitted to leave the bed in from fifteen to twenty-four hours after childbirth, regardless of the number of preceding births or the age of the patient. The only exceptions to this rule were patients who had passed through an unusually long labor, who showed an elevation of temperature, who had suffered injuries, especially as the result of obstetric operations, who had lesions of heart, lungs or kidneys, and those suffering from gonorrhea. Patients were permitted to sit quietly in a chair but prohibited from walking around. They wore a tight abdominal binder, and gradually increased the time spent out of bed to two hours in the forenoon and two in the afternoon. Martin emphasizes the rapid involution of the uterus, he having found it in antiflexion on the seventh day, and of the size of a small fist; he laid stress on the ease with which these patients empty the bladder and bowels and recuperate from the effects of labor. No influence upon lactation was observed. The quiet sitting posture causes a slight tension in the ligaments in which condition they are more quickly involved than when they are relaxed, as in the dorsal position. Embolisms were never seen. Martin counsels care because the early rising favors infection, and therefore, permits early rising only to patients in whom the possibility of an infection during labor can be excluded, and to healthy young mothers under medical observation, if circumstances allow them only a limited time for rest and recuperation.

While Kuestner and Bumm carefully selected the patients permitted to leave bed on the first day after labor, Pfannenstiel, in the Clinic of Kiel, went much further. He included in his experiments patients delivered by forceps or versions, also cases of post partum hemorrhage. In his belief the only contraindications are: septic or gonorrheal infection or strong suspicion of such infection; serious obstetric operations with extensive injuries to the soft parts; protracted labors with pronounced bruising of the pelvic outlet or perineal lacerations.

The patient was permitted to move freely in bed on the first day, and prepared for early rising by gymnastic exercises. Beginning with the first day after labor, the patient was instructed to contract firmly her abdominal muscles about ten times in succession, this exercise being repeated four to five times a day. Then she began to raise herself from the lying into the sitting position, at first with assistance, later on without help. For strengthening the pelvic floor she was instructed to rotate the lower extremities inwards while in the position of extension and slight abduction. As soon as she had left the bed she practiced bending the body forward, backward and sidewise. The patient at first went from the bed to a comfortable chair, then took a few steps around the room, then went back to bed. On the next day she could sit up in the forenoon and afternoon one hour each, and went back to bed after having

walked around in the room. On the fifth day she was up for six hours. After the midday meal she had to lie quiet for two hours. While out of bed she wore a tightly pinned abdominal bandage. In this series of experiments 3 puerperæ left the bed on the first day, 61 on the second, 19 on the third, and 18 on the fourth day. In 90 out of 100 cases the course of the puerperium was normal. Weakness, continued bloody lochial discharge, painful varicosities, irregularity of pulse and dizziness (in a case of myocarditis) forced some of the patients to go back to bed. Ten patients developed fever, seven had fetid lochia (and two of these had cystitis), two had slight mastitis, one angina, two fainted, one a girl who had daily fainting spells during pregnancy the other a weak woman who had lost 1500 ccm. of blood in the third stage of labor.

It was observed that early rising patients seemed to possess an increased resistance to colds and were far less subject to infection, doubtless because the upright position favors the discharge of the lochial secretion and prevents the ascension of vaginal bacteria, while the good tonus of the abdominal wall and effectual closure of the introitus vaginae further emphasized the benefits of the procedure. However, there was a marked descensus in 9 cases, 8 of which were multiparæ and one a weak primipara with a general enteroptosis. The weight of the corpus throws the uterine fundus forward, while the sacro-uterine ligaments pull the cervix back. Thus the vagina is stretched and the danger of a descensus reduced. The general health improves rapidly after early rising, a fact especially marked in cases of severe hemorrhage. On the sixth or eighth day the puerperæ hardly betray any evidence of having passed through labor so recently. Multiparæ stated that never before had they regained their strength as promptly as followed early rising.

The many series of experiments made at the various clinics have not as yet led to a definite set of indications or contraindications. While in the one clinic a certain condition prohibits early rising, in another the same condition may be considered specially adapted for it. Kuestner and Pfannenstiel regard severe hemorrhages, myomatous uteri, etc., as strict contraindications, while Kroenig, on the other hand, believes that these are excellent cases for early rising. Indeed, Kroenig asserts that anemia, weakness, cardiac lesions, varicose veins, existing and suspected infections, are the very conditions which call for a lying-in state as short as possible. Kroenig, in the maternity clinic of Freiburg, undoubtedly has adopted the most revolutionary and daring changes in the customary treatment of the puerperium. The patients rise as early as possible, many of them eight hours after labor is over. Kroenig felt that he could permit his patients to go even thus far because their general condition was unusually good, due to the fact that in approximately 80 per cent. the slumber state produced by scopolamin-morphin had completely eliminated all pain from labor. The following gymnastic exercises, in his opinion, are of great importance: Bending the upper part of the body forward and backward; systematic contractions of the gluteal

muscles and the adductor group, to strengthen the pelvic floor. Beginning with the eighth day galvanic current and massage-bath were given. Most pronounced was the effect of this mode of management upon the morbidity of the puerperal state. The early rising patients exhibited a much smaller percentage of fever cases, this reduction being obtained without any disinfection of either the external or internal genitalia. Cases of thrombosis and embolism also become rarer, while lactation was improved. Early rising, Kroenig states, does not cause retroflexion and descensus, but prevents it. Too much weight has been laid upon the importance of the round, broad and sacro-uterine ligaments in the causation of prolapse. The investigations of Tandler and Halban have proved that the main disposition for the development of this anomaly is found in an inefficiency of the muscles of the pelvic floor, especially of the levator ani and the muscles of the uro-genital diaphragm. But these muscles are strengthened by the systematic exercises of the modern management of the puerpera.

An attempt to record here all reports of all institutions which have experimented with early rising would unduly lengthen this paper. It may suffice to state that they all claimed certain advantages for this change from the older methods. The new methods undoubtedly have some good features and are worthy of careful study. I personally at first felt very skeptical, but after having listened to Martin's paper decided to adopt some changes in my customary practices. I made more use of the exercises in bed and tried to obtain the desirable change in position without fear of harming weak patients by the use of a bed rest which enabled the patient to sit up straight.

We have no right to accept implicitly all the suggestions made by the various writers, in view of the striking difference of opinion which still exists concerning the advisability or danger of early rising in certain pathologic conditions. The time has been altogether too short to test safely the feasibility of these suggestions. The value of gymnastic exercises to-day is generally conceded, but we are far from knowing whether it is wise to begin with them as early as the first or second day after labor. The orthopedic principle of an alternation of exercise and rest is more appropriately carried out if the patient is not permitted to leave her bed eight or ten hours post partum. All the advocates of the new procedure confess that the patients must be kept under careful medical observation. Von Alvensleben of the clinic in Kiel writes: "The puerpera who leaves the bed early must remain under the surveillance of the physician or midwife; she must be watched with care so that every disturbance may be recognized at once and treated. Any neglect in this respect might readily lead to much more harm than if the patient was in bed." In private practice this continued observation is a difficult problem. It would call for numerous visits of the physician, and thus would be possible only in the houses of the wealthier population. Opitz, therefore advised the new mode of management of the puerperium only for pa-

tients who are able to remain under the care of their physician and can afford "to enjoy a prolonged rest of mind and body." It seems impossible to give the poorer people the required attention in their own homes. The fact should be borne in mind that more than 80 per cent. of all puerperæ (in Germany) pass through labor without the services of a physician. The young mother who had the novel experience of early rising in a maternity hospital is likely to spread the news among her friends, and the public at large soon will demand the same modern treatment from the attending midwife. The new style will come in vogue, in the city and in the country, but minus the continued, careful observation by a physician. Very often the young practitioner feels especially called upon to adopt the very latest methods in his practice; but how shall he avoid deplorable failures and serious accidents, if even the experts have not come to an agreement concerning the benefit or danger of early rising in certain conditions? Fritsch explicitly states that early rising should not mean anything but the careful attempt to get the patient out of bed. How shall that be done with patients of the middle classes? As soon as she is permitted to sit on a chair, she will be tempted to resume her household duties, which have increased considerably since the child is born. For the larger part of the public, early rising will be identical with early working. If early rising will mean earlier discharge from the hospital, then the new method certainly will be deprived of all advantage, because it surely will lead to earlier return to work.

Practically all the reports concerning this new method emphasize certain advantages, but very little attention apparently is given to the question whether these benefits are only immediate or lasting. From six to nine days, all the woman spends in the clinic, is hardly time enough for observing the development of a retroflexion. As a rule only on the tenth day has involution progressed far enough, and the uterus reduced so that it can fall back into the sacral excavation. It is obvious that in the upright position the uterine fundus is more likely to fall forward than in prone posture, but the fact can hardly be excluded that later the uterine fundus again sinks backward if the organ remains soft and the ligaments relaxed, especially if there has existed a tendency toward retroversion before pregnancy. Descensus and prolapse of the vagina, like embolism, as a rule, also appear late in the puerperium. Finally the so-called late infections, usually the result of gonorrhea, commonly appear at a time when the early rising puerpera will have left the hospital.

My connection during ten years with the Convalescent-Home for Puerperæ (Woehnerinnen Unterkunft) in Berlin gave me a splendid opportunity to study the sequelæ of labor occurring late in the puerperium. Indeed, this institution has been founded for the very purpose of preventing puerperæ returning too early to their duties. Into this institution are admitted patients discharged from the Royal Frauenklinik, the Charité, the maternity home "am Urban," the maternity of the Salvation Army and a number of other public and private charity maternities.

There I had occasion to observe that women discharged from the Charité clinic, and counted as "cured" in Martin's statistics, had to stay in bed for weeks on account of hemorrhages, inflammations, retroflexions and prolapses. And in the Charité clinic only the healthiest puerperæ were permitted to rise from 15 to 24 hours after labor. How could it be possible to exclude with any certainty the presence of an infection? Rarely is the perineum, the vagina or the cervix found free from injuries immediately after labor; these can easily become infected after the patient has left her bed.

I personally would insist that patients showing an elevation of temperature should be positively excluded from early rising, not only until the cause of the fever has been revealed, but until the temperature has returned to normal. The claim is well founded that the upright position propagates the discharge of the lochial secretions and thus deprives the saprophytes of a suitable culture medium, but streptococci, staphylococci and gonococci will spread into the uterine cavity irrespective of the posture of the patient. Puerperal infection is not prevented by the new method, and certainly is aggravated if extant, and instances of very high fever can be found among the early risers. Inflammatory processes, like gonorrhea, subside promptly under enforced rest. During the puerperium a beginning parametritis often heals, but after early rising not rarely a latent process suddenly flares up. The advantage of a prompt restoration of the tonus of the abdominal muscles has been claimed for early rising, but it has never been disproved that the same result can not be obtained with exercise in bed and the use of a proper abdominal binder. It is difficult to assume that the pelvic muscles should speedily return to normal if they are not given at first sufficient time for rest. It is a well known fact that prolapse and a pendulous abdomen are more common among women of the working class than among those who spend ample time in bed after childbirth. Mothers, who stay in bed for a long time on account of fever, never develop a descensus. Many writers acknowledge that metrorrhagias do often occur in early risers, but they consider this of no consequence. It would seem that all conditions which cause a prolonged hyperemia of the uterus would also interfere with normal involution.

One of the most important arguments against early rising is the fear of thrombosis and embolism. Kroenig actually claims that early rising is the best protection against just such an accident, and bases his claim on his personal experience with 3000 cases. Only in one case of endocarditis did he observe embolism after having permitted the patient to leave her bed soon after labor. If we include the cases of early rising after laparotomies the number of cases of thrombosis is not small. Ries and Boldt recorded three cases of thrombosis in 1000 early rising patients, Sellheim three in 215, Cohn three in 100, and other instances have been reported by Zurhelle, Latzko and others. During a discussion of this question before the Gynecologic Society of Berlin, Wagener of Java made

some statements of far-reaching importance. "There is a law in Java which compels the woman to rise and walk around immediately after childbirth," he said. "She is not permitted to stay in bed even after very difficult labor. Nowhere in this world have I seen as many cases of embolism." He observed in these women a strikingly high frequency of anemia, neurasthenia and of prolapse without a perineal laceration. Fromme reports from the clinic of Halle the occurrence of fatal embolism on the ninth day in a woman who left the bed the second day.

Of course we are all greatly influenced by our personal experience, however limited. The only two cases of embolism I had in my practice occurred in young mothers who had left the bed early of their own will. The one, a primipara of 28 years, rose to void urine 40 hours after a forceps delivery. She fell fainting back on her bed, and died eight hours later, dyspnoic and deeply cyanotic. The other patient was a IVpara, who in short intervals had easily passed through the four labors. She had extensive varicosities of both thighs and a slight phlebitis of the left vena saphena. Though instructed to keep very quiet, for unknown reasons she left the bed on the fourth morning. She fainted and died before a physician could reach her bedside.

We differentiate two types of thrombosis, the mechanical and the septic. The first, the rarer one, usually takes its course without fever and is caused by heart failures, chlorosis, excessive loss of blood, extensive varicosities, etc., and is likely to occur wherever the blood-current is retarded. In the presence of such conditions the possibility of a mechanical thrombosis can be anticipated, and muscular exercise will prove an important preventive, because it will foster better distribution of the blood.

In the more common group of septic thrombophlebitis, coagulation of the blood results from infections with bacteria lying in the intima, or from a lymphangitis in the adventitia of the affected blood vessels. If these processes are mild in character they can hardly be differentiated from those of the first group. They are not recognized as being of a septic nature because the slight elevation of temperature may easily be due to other causes. Early movements for the sake of exercise, or especially early rising from bed, in these cases would prove very harmful. For this very reason, in the clinic of Bonn, women with fever or signs of a thrombosis were prevented from rising.

There does exist a certain disposition for the development of embolism, but we have no means of ascertaining the presence of this disposition. Rising might favor the loosening of a thrombus. During the last Surgical Congress in Berlin, in 1908, A. Fraenkel claimed that "the prophylaxis of thrombo-embolism is identical with the prophylaxis of wound-infection." This certainly applies as well to obstetrics as to surgery. The neater, quicker and the more skilled an operation is performed, the less injury is done to the tissues surrounding the field of operation. The more skillful labor is managed, the better will be the

prognosis for the puerperium. Before and during pregnancy prophylactic measures may be resorted to which will assure a better result and less danger of undesirable sequelæ after a proper management of the puerperium. In order to prevent relaxed abdominal walls the pregnant woman is instructed to walk in the open air, possibly to indulge in an out-door sport, or exercise systematically, to bathe and to take proper nourishment. In order to facilitate urination after labor, the woman should be taught during pregnancy to empty her bladder while lying on a bedpan. Descensus and prolapse can be prevented by avoiding all unnecessary forceps extractions, by sewing the perineum very carefully, even if the tear is small. We will prevent infections by cleaning the patient and by disregarding Kroenig's views. Even in the absence of streptococci and staphylococci the close neighborhood of the anus must not be ignored. The perineum may become soiled and in this way the genital tract seriously infected.

No positive proof as yet has been furnished for the advantage of beginning with the gymnastic exercises within the first few days after labor, or indeed to have the patient leave her bed for this purpose. Early rising clearly involves certain dangers but at present we have no reliable means of avoiding them. The various writers must have had their good reasons for suggesting new methods of management for the puerperal state, but certainly further investigations are required to demonstrate the necessity of such revolutionary changes and the advisability of applying them also to the work outside of the regular maternity. Sellheim, at the meeting of the Gynecologic Society of the Oberrhein, stated that the experiments with these new methods in the maternities are still to be continued, and that the results so far obtained are neither conclusive nor convincing. In view of such facts the man practicing in the city or country may justly ask himself whether he has a right to participate in this experimental work, and whether in private practice the new theory of early rising in its present stage of development will offer enough advantages to outweigh its apparent disadvantages.

CLINICAL REPORTS.

IDEAL AGE FOR CLEFT PALATE OPERATIONS.

By V. P. BLAIR, M. D., of St. Louis.

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In the determination of the time at which operations for closure of clefts of the hard palate ought best to be done, two considerations confront us—the ideal and the surgically probable.

It was the belief of the older surgeons, the pioneers in this work, that the probability of surgical success is greatest when the cleft is relatively small and the soft tissues, from which the obdurator is to be made, are comparatively well developed. At the age of twelve or fifteen we still have the excessive nutrition of growing tissue; the alveolus is well developed, the arch of the palate is high and there is, relatively, a large amount of tissue in proportion to the cleft to be bridged. Further it is supposed that by this time the intelligence of the patient and the desire for relief from the deformity will materially aid in obtaining the desired result. It was for these reasons that the older surgeons chose this age as the time of election.

Unfortunately, though the probability of obtaining a surgical result at this age be great, the result obtained is at best relative. The nasopharynx and nasal cavities, and the tongue, of one so afflicted, develop abnormally, and where speech has been attempted with a cleft palate, the imperfect enunciation that results is but partially corrected by a later restoration of the roof of the mouth and the vellum.

The "cleft palate voice" is a stigma that usually outlasts the most perfect late operation. This has caused more recent operators to seek an earlier period for repair, and, by a number, the age of two has been pronounced as ideal because there is at this time a fair development of the mucoperiosteal covering of the bone, with considerable arching of the palate due to the alveoli of the milk teeth, because it is possible to narrow the cleft by orthodontic apparatus. Further at this age the child's speech is but imperfectly developed, therefore the cleft palate habit is not fully formed and successful operations at this age give excellent voice results.

Still other operators, impressed with the fact that, at birth there was simply the cleft, though relatively wide, and that all the structures were normally developed, and that the longer growth went on with an open palate the further these structures receded from the normal, sought a

still earlier age for surgical interference. Close study of the subject showed that, besides better after results, the very early ages presented surgical advantages that had been at first overlooked. Certain of these advantages refer to the local conditions while others concern the general condition of the patient.

Of the local conditions that lend themselves to early operations, there are two: First, the absence of teeth and the lack of pronounced development of the alveolar processes; these make it very easy to go any distance in obtaining flaps of any size for the closure. Secondly, the bones are soft and pliable, and exceedingly well nourished, which make it possible to shift bodily the separated maxillæ and unite them in their normal position. The first of these has been taken advantage of by the English school, led by Lane, and the second operation is an American development long championed by Brophy.

Without going into a discussion of the relative advantages of the two methods, I want to call attention to the fact that, either of these operations being possible, and both presenting high probabilities of surgical success, there are advantages in the early operation that decrease in direct proportion as the age of the unoperated child increases. Based on my own observation, these advantages are:

I. That the infant of twelve or twenty-four hours stands the shock of operations as well as it does the violence to which it is subjected during parturition, and that this resistance to shock decreases as the age of the infant increases.

II. By this very early operation the child will be in a condition to be nursed by its mother when it is seven or ten days old; further, that it is possible in most cases to preserve the flow of the mother's milk that long by artificial means—not a breast pump,—which gives the child all the immediate and late advantages that are derived from breast milk.

III. This very early repair of palate and lip save the parents an immense amount of heartache and chagrin.

IV. The health of infants is always better after than before the repair of the cleft. I have seen a number of impressive instances of this fact and it has come to be my belief that the old observation, that cleft palate infants were apt to die through lack of development in other parts, is incorrect; that these deaths were due directly to the cleft. This belief is borne out by the fact that the infants coming under my observation are on an average as healthy after early operations as are normal infants.

V. A normal nasopharynx and a normal voice is assured by early operation.

In the very early operations the ideal and the surgically possible meet. Except that we must exercise some discretion about avoiding operation during the process of teething. I am convinced that the longer the operation is deferred the less advantage is to be gained from it, but also that there is no age at which, with appropriate technique, we cannot operate with advantage.

Metropolitan Building.

CONJUNCTIVITIS IN BILIBID PRISON, MANILA.

By RALPH T. EDWARDS, A. M., M. D., of the Government Serum Laboratory of Phrapatoom, Siam.

The work upon which this paper is based was done while the author was doing the routine pathological and microscopic work at the prison in the service of the Bureau of Science, Manila.

Through the kindness of Dr. Shattuck, Chief of Prison Sanitation, and of Dr. Christiansen, who was fighting eye diseases in the prison, we were permitted to make slides and cultures from the following cases: (see table on next page)

In No. 18, there was a luxuriant growth of micrococcus luteus (Kohn), but we do not think that this was the cause of the inflammation; the real offender probably was overshadowed by the saprophyte, hence we consider that case also as "undetermined."

In this paper we have made the diagnosis of Koch-Weeks conjunctivitis in all cases where the cultures were characteristic, even when we were not able to make the diagnosis from the smear. Also we left as "undetermined" all cases in which we failed in the culture.

Out of the 21 cases examined we tabulate the following:

B. Koch-Weeks was isolated 9 times, or about	43.90%
Staphylococcus pyogenes aureus was isolated 2 times, or about . .	8.86%
Staphylococcus pyogenes albus was isolated 1 time, or about . . .	5.43%
Aureus and albus together were isolated 1 time, or about	4.43%
Micrococcus luteus (Kohn) was isolated 1 time, or about	4.43%
Cultures were negative 7 times, or about	33.33%
Smear and culture were both negative 3 times, or about	13.30%
Smear apparently positive, but culture failed to reveal B. Koch-Weeks 2 times, or about	8.86%
Bacilli not intracellular, but with morphology like B. Koch-Weeks, culture not showing B. Koch-Weeks, 7 times, or about	33.33%

This last group is in part made up of cases in which a more vigorous organism was also present and on artificial media overshadowed the weak bacillus, but there is a large per cent. which evidently found the media unsuitable. This group then would call for more work in the establishment of their causation. Except in the cases mentioned as having been attempted using acid media, the original cultures were made in alkaline (1%) bouillon and 5% peptone alkaline (1%) agar.

Probably the chief interest of this paper lies in the fact that such a large

per cent. of the cases are of the Koch-Weeks variety, and that the second largest group, failed to grow in media suitable for the Koch-Weeks bacillus, at the same time being too small for the Morax-Axenfeld.

NO.	DISCHARGE	PAIN	SMEAR SHOWED	STAIN	CULTURE
1	Serous	Slight	Not made	—	B. Koch-Weeks
2	Pus	Pos.	Intra- and extra-cellular bacilli	Dilute Z. N. carbol-fuchsin	Do.
	Serous	Do.	Extra-cellular bacilli	Do.	Staphylococcus pyogenes aureus
4	Do.	Slight	Small bacilli but no cells	Do.	Negative*
5	Do.	Do.	Extra-cellular bacilli	Do.	B. Koch-Weeks*
6	Do.	Do.	Negative	Do.	Negative*
7	Do.	Pos.	Extra-cellular bacilli	Do.	Do.*
8	Pus	Do.	Negative	Do.	Do.
9	Do.	Do.	Extra-cellular bacilli	Do.	Staphylococcus pyogenes albus
10	Do.	Do.	Extra-cellular bacilli	Do.	B. Koch-Weeks
11	Do.	Do.	Intra- and extra-cellular bacilli	Do.	Do.
12	Serous	Pos.	Small bacilli no cells	Do.	Negative
13	Do.	Slight	Negative	Giemsa	B. Koch-Weeks
14	None	Do.	Do.	Do.	Negative
15	Serous	Do.	Lost	—	B. Koch-Weeks
16	Pus	Pos.	Cells only	Dilute Z. N. carbol-fuchsin	Staphylococcus pyogenes aureus et albus
17	Do.	Slight	Intra- and extra-cellular bacilli	Do.	B. Koch-Weeks
18	Serous	Do.	Cocci	Methylene blue	Micrococcus luteus (Kohn)
19	Pus	Do.	Intra- and extra-cellular bacilli	King's	Negative
20	Serous	Pos.	Negative	Do.	B. Koch-Weeks
21	Pus	Do.	Intra- and extra-cellular bacilli	Do.	Staphylococcus pyogenes aureus

*Made on acid media, but transferred to alkaline in two hours. In these cases, while the organism must have been B. Koch-Weeks or some other germ easily killed by acid, we leave the cause "undetermined."

MEDICAL AND SURGICAL PROGRESS.

SURGERY OF THE PITUITARY GLAND.

A REVIEW OF RECENT LITERATURE.

By MALVERN B. CLOFTON, M. D.

1. HYPOPHYSIS CEREBRI.—Cushing (*J. A. M. A.*, Vol. LIII., No. 4).
2. IS THE PITUITARY GLAND ESSENTIAL TO THE MAINTENANCE OF LIFE.—Reford (*Johns Hopkins Bulletin*, Vol. XX., No. 217, p. 105).
3. SURGERY OF THE HYPOPHYSIS.—(*Journal de Chirurgie*, Tome 1. No. 7).
4. TREATMENT OF HYPOPHYSIS TUMORS.—Hochenegg (*Dent. Zeitsch. f. Chir.*, Band C., No. 1).
5. REMOVAL OF HYPOPHYSIS TUMOR THROUGH THE NOSE.—Smoler (*Wiener Klin. Wochenschrift*, XXII., No. 43).
6. OPERATIVE TREATMENT OF HYPOPHYSIS TUMOR IN CASE OF ACROMEGALLY.—(*Lecene Medical*, Vol. XVII., No. 85).
7. PARTIAL HYPOPHYSECTOMY FOR ACROMEGALY.—Cushing (*An. of Surgery*, Vol. 1, No. 6).
8. REMOVAL OF TUMORS OF PITUITARY BY INFRANASAL ROUTE.—Kavanel (*A. M. A.*, November 20th, 1909).
9. PITUITARY TUMOR IN ITS SURGICAL RELATIONS.—Church (*J. A. M. A.*, Vol. LIII., No. 2, p. 97).

In recent years the physiology of the hypophysis and the symptomatology of its diseases, have been developed and the successful surgery of this organ has been one of the marvels of modern medicine. It is not unreasonable to hope that for diminished activities of this gland, organotherapy offers a bright outlook, but in cases of hyperactivity the cruder methods of surgery have to be restored to. Experimental observation on animals has taught us much, particularly the work of Howell and Schafer on the functional activity of the extirpated gland and its different parts. Paulesco showed by his experimental surgery the influence of partial and complete removal of this gland. This latter work has been amplified and by means of a better technic. Reford has been able to show that the pituitary gland is essential to the maintenance of life, though young dogs survive the removal of the gland for a considerably longer period than older dogs; it has been possible also to prolong life for a time by the immediate or antecedent transplantation of the anterior lobe or by post-operative injection of the extract. No characteristic symptoms follow the removal of the posterior lobe, but the removal of part of the anterior lobe is followed by profound alterations, particularly by an increase in

the fat, this condition comparing to that of hyposecretion. The total removal of the gland is followed in the course of days or, at most, a few weeks, by death with a peculiar and characteristic train of symptoms. There is also shown a close interrelation of the ductless glands, and changes in one are followed by changes in the other.

Cushing has summed up the knowledge of this gland by stating that there are two conditions, one due to the pathologically increased (hyper-pituitarism) activity of the pars anterior, and expresses itself chiefly as an overgrowth, gigantism when originating in youth, acromegaly when originating in adult life; the other due to a diminished activity (hypopituitarism) of the same epithelial structure (pars anterior) expresses itself chiefly as an excessive, often a rapid, deposit of fat, with persistence of infantile sexual characteristics when the process dates from youth, and a tendency toward loss of acquired signs of adolescence when it first appears in adult life. A tumor of the gland itself or one arising in its neighborhood, and implication of the gland by pressure is naturally the lesion to which one or the other of these conditions has hitherto been attributed, though it is probable that oversecretion and undersecretion occur irrespective of tumor growth. When a tumor is present, surgery is the treatment demanded, but a clear distinction must be made between the local manifestations of the neoplasm in its neighborhood, and those of a general character due to disturbances of metabolism due to alteration of the hypophysis.

Proust's article is divided into these parts: 1. The operative methods. 2. The diagnosis of tumor and the indication for intervention. 3. The results of the operations. Schloffer was the first to approach this field, in 1906, and about the same time Horsley began his work. There are two classes of operation, the intracranial, either through the temporal region (Horsley) or frontal; and the transphenoidal, the operation of choice, either through the nose (Schloffer) or by the bucco-nasal way, or by the intermaxillary way (Kocher). The best operation is that of Schloffer as modified by Hochenegg. For the technical side this is the best article on the subject. In making a diagnosis, the most important is the enlargement of the sella turcica as shown by *x*-ray. Next comes the compression of the chiasm and the bitemporal hemianopsia, and thirdly the disturbance of the function of the hypophysis, either shown by the syndrome of acromegaly or the degeneracy adipose-genitale (Froelich). He gives the reports of the six operations up to date, but not including Horsley's work which has not been published. The first case was Schloffer's, an adenoma removed by the transphenoidal nasal route, followed by death on the third day from facial erysipelas. The next three were operated by Von Eiselberg, the first, an epithelioma operated by Schloffer's method, recovered with marked improvement noted over a year later. The second case, a sarcoma, died in two days from meningitis; the third, angio-sarcoma, recovered from the operation and was doing well six months later. The fifth case was operated by Hochenegg for acromegaly, going through the frontal sinus by a plastic operation that led down to the sphenoid and an adenoma was removed. There was marked improvement noted later in the acromegaly. The sixth case was operated by Borchardt successfully for tumor of the pituitary.

Hochenegg reports his third case; the success in the first two cases was not repeated in the third. It was in a patient with acromegaly, the nose and frontal sinus turned back and the sphenoidal sinus opened. Only a part of the tumor could be removed as the most of the tumor was inaccessible. The patient roused after operation and said that the pain in the

vertex was gone, but sudden heart failure the next day proved fatal. The tumor filled the sella turcica and extended into the frontal lobe. Hochenegg believes that operative measures have a chance for success only for small tumors confined to the base and not penetrating into the brain substance.

Smoler reports a case where the hypophysis tumor was readily removed by the nasal route, but the patient succumbed to pneumonia from aspiration of blood. In another case of this kind he would make a preliminary trachelotomy.

Lecene's patient was a man of 38, presenting the clinical picture of a typical acromegaly with epileptiform manifestations and impaired vision. A tumor was found in the hypophysis and was apparently successfully removed by the transphenoidal route, but a sudden fatal collapse occurred on the thirty-sixth day.

In speaking of the various methods of approach Cushing states that in one instance he tried the temporal route of Horsley, but the tumor did not rise above the clinoid processes so it could not be reached. For certain conditions not accompanied by great enlargement, the transphenoidal route will be most frequently followed, and the danger of meningeal infection will be lessened if urotropin is freely administered, as it is excreted by the cerebro-spinal fluid. He reports a case of acromegaly of several years standing, with pronounced skeletal changes. A preliminary tracheotomy was done because of the large tongue. An osteoplastic flap was made through the frontal sinus and the nose turned down, and one-half of the exposed gland removed through the sphenoidal cells. No tumor was found; only overactive pituitary. After several months he felt much improved, no headaches, and looked much better, and the photophobia had almost disappeared.

The infranasal route is proposed by Kavelin in contradistinction to the supranasal route, for reaching the tumor of the pituitary body. The technic in general consists in elevating the nose by an incision about the alæ, cutting the cartilaginous septum, removing the middle turbinate, deflecting the septum, locating the sphenoidal foramina, biting off the intervening attachment of the perpendicular plate of the ethmoid and vomer, entering the sphenoid cells, and thus reaching the floor of the sella turcica.

Church details the various manifestations, of supposed pituitary disorders, which include simple adiposity, adiposity with genital atrophy, to which he adds the general retardation of physical and especially sexual development. There is besides the clinical type of acromegaly, which is regarded by many as due to the hyperfunction of the gland, while the other symptoms mentioned above are probably due to hypofunction. In tumor of the hypophysis the symptoms may be those of ordinary brain tumor, and the author believes that they are so definite that with the aid of the *x*-ray the diagnosis may be made with certainty. In children where acromegaly is not produced the growth is stunted, and the sexual development retarded. The impingement on the optic chiasm impairs the vision; the atrophy in the early period being limited to the nasal half of the disc. In adults impotence in men, and amenorrhea in women, have a significance, and occasionally general adiposity, and genital dystrophy. The *x*-ray, as was shown by Oppenheim, is capable of furnishing a picture which clearly outlines the sella turcica, and any enlargement in the bony depression can be positively correlated with increase in size of the pituitary. Several of his cases were diagnosticated by this means. It is a question in his mind whether all tumors of the pituitary should be

operated. In discussing the operative methods he states that Horsley has operated in a number of pituitary cases by making an opening on one side of the head, preferably the right, and approaching the tumor from the side, the steps of the operation being similar to those for extirpation of the Gasserian ganglion. This work has not yet been published. McArthur has operated by a lateral route advancing to the middle along the roof of the orbit and in the one instance was able to remove about two-thirds of the growth. The author believes that the nasal route is the best, despite the resulting deformity. He reports on six cases of tumor of the pituitary. Case I. was diagnosed from the menstrual history, double temporal hemianopsia, optic atrophy and the *x*-ray picture, but no operation was performed. Case II., a boy of 14, had no evidence of acromegaly. Headaches came on at intervals since the third year, with vomiting, frequently terminating in nose bleed with apparent relief. Double optic atrophy with hemianopsia, showed a pituitary cyst with calcareous plates. This case was operated by Horsely and a pituitary cyst containing chocolate-like fluid, was evacuated. The convalescence was satisfactory but the boy died eighteen months after the operation. Case III., a woman of 25 years, ceased to menstruate at 22, had headaches, bilateral nasal atrophy and diminution of the eye grounds. An *x*-ray showed a much enlarged sella turcica. At operation, going over the orbital plates, a cyst of the pituitary was reached and evacuated, but the frontal lobe was lacerated in the procedure and the patient died in eighteen hours. Case IV., a man of 36 years, had for five months noticed the eyesight of left eye failing, and he had intense left-sided headaches which became less in the last two months. The field of vision showed a shapely defined, right side, temporal hemianopsia. The patient had been impotent for a year. An *x*-ray showed an enlarged sella turcica. He was operated by Von Eiselsberg by the nasal route, and recovered. The tumor was a malignant epithelioma. Case V., a boy, aged 14, for one year had noticed his vision getting bad, and later there were temporal headaches, later hemianopsia was found and atrophy of the disc. The *x*-ray showed an enlarged sella, but the patient refused operation despite the *x*-ray finding of an enlarged sella. There was no operation, but the boy lived over four years after the symptoms of tumor were felt. Case VI., a man of 33, had for six years noticed failing vision in one eye, and later of the other, the outer half of the field going first, marked atrophy of the disc on one side. The *x*-ray showed a large sella turcica. No operation was performed, because the patient was in such excellent good health, with no other symptoms than those of the eyes.

THE ETIOLOGY OF ACUTE POLIOMYELITIS.

A REVIEW OF RECENT LITERATURE.

By CARL FISCH, M. D.

1. THE TRANSMISSION OF ACUTE POLIOMYELITIS TO MONKEYS.—Simon Flexner and Paul A. Lewis (*Jl. A. M. Assn.*, 1909, November 13).
2. THE NATURE OF THE VIRUS OF POLIOMYELITIS.—Simon Flexner and Paul A. Lewis (*Jl. A. M. Assn.*, 1909, October 18).
3. INVESTIGATIONS OF THE ETIOLOGY OF EPIDEMIC POLIOMYELITIS IN CHILDHOOD.—Paul E. Roemer (*Muench. med. Woch.*, 1909, No. 20).
4. APPEARANCE OF ACUTE ANTERIOR POLIOMYELITIS IN CHICKENS.—R. Wilke (*Deutsch. thierärztliche Wochenschrift.*, 1909, No. 20).
5. SPINAL PARALYSIS OF CHILDREN AND EPIDEMIC PARALYSIS IN DOGS.—A. Sturm (*Deutsch. thierärztliche Woch.*, 1909, No. 25).
6. ACUTE POLIOMYELITIS.—Landsteiner and Popper (*Zeitschrift. f. Immunitätsforschung*, Vol. II).
7. OBSERVATIONS ON ACUTE POLIOMYELITIS.—E. Krause (*Deutsch. med. Woch.*, 1909, No. 42).
8. OBSERVATIONS IN A POLIOMYELITIS EPIDEMIC.—V. Neurath (*Wiener med. Woch.*, 1909, No. 37).
9. SYMPTOMATOLOGY OF ACUTE ANTERIOR POLIOMYELITIS.—Alfred Forster (*Berl. klin. Woch.*, 1909, No. 49).

Efforts thus far made to establish the etiology of acute poliomyelitis resemble the condition met with in the search for the cause of a number of other etiologically obscure diseases. That an infectious process exists was clinically, pathologically, and from the character of its sporadic, endemic and even epidemic dissemination, known for some time. The search for the causative agent naturally occupied the minds of many investigators. The result was the finding in some of the cases of certain well-known bacteria,—staphylococci, streptococci and pneumococci. While some of the authors (for instance, Potpeschnigg reported in *Wien. Kl. Woch.*, 1909, No. 39, 14 cases; in all of them, in the lumbar fluid, a Gramm-staining diplococcus was found) are inclined to believe that those bacteria are the source of the infection, the probability is that they have nothing whatever to do with it. All the bacteria found are well known, as well in their morphologic character as in their pathologic activity. Their effect on the animal organism has been so widely and so variously studied, especially as to their action on the structures of the nervous system, that it would be surprising to find them at the base of such a characteristic and well defined pathologic process. Furthermore, the finding of bacteria, either in the lesions themselves or in the cerebro-spinal fluid has been absolutely negative in the majority of cases and their presence therefore in some cases must be considered as accidental or as a secondary invasion.

The possibility of a protozoic origin was suggested, but neither direct nor indirect evidence could be found to support this hypothesis. The indirect evidence was sought by inoculation of rabbits, guinea pigs and mice with the cerebro-spinal fluid, the exudate of the lesions themselves, or the blood of the patient. While Krause and Meinicke, by inoculations of rabbits, thought they had found signs of paralysis, all other experiments, even by the cerebral inoculation, have proved negative, especially those of Roemer; Flexner and Lewis had the same negative result.

Perhaps it was due to the admirable success in studying syphilis in monkeys, originated by Mechnikoff and Neisser, that two investigators in different countries, our own country and Germany, simultaneously proceeded to attempt the reproduction of poliomyelitis in monkeys. Both worked independently, although it may be said that neither of the two workers has more claim to priority than the other. Flexner and Lewis published on November 13, 1909, their negative findings of microscopic or cultural trials with the bacteria mentioned above. Then they proceeded to inject the cerebro-spinal fluid of cases of poliomyelitis into monkeys after fruitless experiments on the ordinary laboratory animals. They succeeded in producing typical paralysis.

On the 7th of December appeared the publication of Roemer, who had made his studies on cases occurring in Marburg and its surroundings during the fall of 1909. Roemer used a small portion of the pons of a case of poliomyelitis, made an emulsion of it and injected 0.2 c.c. into the brain of a monkey and at the same time into six mice, six guinea pigs and six rabbits; of each series two intravenously, two intraperitoneally and two intracerebrally. All these animals remained well up to the date of his writing (October 2nd, 1909). The monkey died eight days after the inoculation with typical paralysis. For five days after the infection the animal appeared perfectly well; on the sixth day he appeared languid; as it was very obstreperous, no temperature was taken. The seventh day showed it depressed and weak, but without any specific symptoms. It was surprising to observe the rapid development of the paralytic symptoms. During the night of the seventh day the monkey showed a slight paresis of the right arm. In the morning of the eighth day the animal was paralyzed in all extremities. The sensorium was free and he could use the muscles of the neck. He died in the evening of the eighth day. The autopsy did not reveal any changes in the internal organs, nor in brain or spinal cord, except a marked congestion of the surface of the brain and on the cross section of the cord. The histologic examination made by Beneke gave the same pathologic and histologic changes as in the human cord.

Roemer, therefore, has demonstrated the transmissibility of poliomyelitis, a result that is in agreement with the work of Landsteiner and Popper and of Knöpfelmacher. The results in other animals that Krause and Meinicke believed they had obtained in their experiments on rabbits, represent no definite evidence that their interpretation of the paresis as poliomyelitic, is true, especially because they give no report of the examination of the brain or cord.

The brain and cord of this first monkey of Roemer appeared sterile on all culture media. Inoculated intracerebrally into several rabbits it proved ineffective. The intracerebral injection of 0.2 c.c. to .3 c.c. of the same emulsion into another monkey on November 17th, caused death from paralysis on November 29th. Incubation (first symptoms) was ten days after infection. The pathologic condition was also typical. Roemer, therefore, proved that the virus of poliomyelitis is transmissible from one

infected monkey to another. The nature of the virus is that of a living virus not demonstrable by microscopic or cultural methods. The culture in the living organism will allow of closer study of the character of the process.

Flexner and Lewis have at the same time worked in the same line and have independently obtained the same success. Their transmissions from one monkey to the other have reached the number of six. Their work goes deeper into the nature of the virus than Roemer's. The impossibility of finding anything suggesting formations like a microorganism, not only in the human cases but also in the monkeys, permitted a comparison with the viruses of vaccinia and rabies. For these the virus, too, is not demonstrable by our ordinary methods. They remain active in glycerine. The spinal cord of a monkey, dead from poliomyelitis, was kept in glycerine for seven days. After removing the glycerine by salt solution, the emulsion was introduced intracerebrally into a fresh monkey who developed the disease in ten days. The question, in this experiment, whether the effect is due to the virus or to an adherent toxic substance, was answered by injecting a third monkey with the fresh cord of the same monkey that was used for the glycerine test. It developed the paralysis on the eleventh day.

The next step in the investigation of the authors was given by the question whether the virus is filterable. They made an emulsion by rubbing the spinal cord with sterile sand and filtering the emulsion through a Chamberlain filter. A clear fluid, sterile and without color, resulted. Injected into the brain of a monkey it caused the development of paralysis in seven days. The virus of poliomyelitis is filterable and not *visible* to microscopic demonstration.

These findings are epochal; they arouse the hope that the nefarious, widely ranging infection, can be mastered either by prevention, as in vaccinia or hydrophobia, or by secondary products of the virus. It is true in all of these diseases, the obscurity of the nature of the infection obtains to the same degree. In vaccinia and the virus fixe, so far, only empiric and experimental positive observations, amounting to many millions of cases in vaccinia and to hundreds of thousands in hydrophobia, are the only evidence of the effect of the vaccination. An explanation of the nature of their causation is so far impossible.

The last addition to our knowledge by Flexner and Lewis that is also very important, is the demonstration that the poliomyelitic virus will cause nerve tissue destruction by simple subcutaneous injection of it, as shown, also, in experiments on monkeys. The problem of entrance of the virus is unsolved. Sporadic cases, and in epidemics and epidemics the establishment of the fact that in no case can a connection directly with another patient be proved, suggest strongly that such a contact from individual to individual does not obtain in this infection. This knowledge has led to the protozoic character of the virus, analogous to malaria, trypanosomiasis and other protozoic diseases, or to the filterable virus of yellow fever. As possibility of an analogous type of infection with poliomyelitic virus, it is well to consider the reports in veterinary medicine about epidemic diseases in domestic animals that, at least clinically and epidemiologically have closely the character of the children's paralysis.

Wilkes has reported an endemic of acute anterior poliomyelitis in chickens. The condition was closely studied, and found to be identical down to the histologic changes, with the findings in human cases. Another paper in this direction was published by Sturm, entitled, "Spinal

Paralysis of Children and Epidemic Paralysis in Dogs." Here, too, the clinical and pathological data strongly resembled those in the human disease. These observations exclude, of course, the probability of infection from diseased animals. As reported above, many attempts to infect lower mammals and other vertebrates with the virus have always resulted negatively. Either, therefore, the virus in man and monkeys is different from that of the lower animals, or the infection is caused, as in yellow fever, by an intermediate host. It is well known to what degree these animals are usually inhabited by a great number of parasites of the skin. Some of them, occasionally, become parasites, at least for a short time, of the human body, and by their bites are liable to transmit infectious organisms. This is a possibility given, for a number of well known diseases (recurrens by *cimex-lectucarius*, transmission of the pest bacillus from one rat to the other and to man, in California by one ground squirrel to another, and to man). An investigation of this suggestion, although so far only a phantasy, might result in clearing up the transmission in this or another way, as yet undiscovered.

[After finishing this review, it was learned that Leiner and v. Wiesner (*Wiener klin. Woch.*, 1909, No. 49) also have succeeded in inoculating monkeys and transmitting the disease from one to the other.]

ON CONGENITAL HEART AFFECTIONS, ESPECIALLY IN
RELATION TO THE DIAGNOSIS OF THE
VARIOUS MALFORMATIONS.

By ALFRED FRIEDLANDER, M. D.

The Wightman Lecture for 1909.—Carpenter (*British Journal of Children's Diseases*, August, September and October, 1909).

The coincidence of congenital malformations of the heart with malformations in other regions of the body, is a matter of every day experience. The associated defects may be external, such as hare lip, cleft palate, supernumerary auricles, syndactylism, webbed fingers, and the like, or there may be internal maldevelopments. As examples may be mentioned unilateral kidney, absent spleen, malposition of the intestines, transposition of the viscera, etc.

Deafmutism is sometimes an associated condition, as also is Mongolian idiocy. Other congenital defects of the central nervous system are at times associated with congenital heart lesion, *e. g.*, Friedreich's ataxia. Congenital malformations of the heart are sometimes hereditary. Inquiry has been directed to the state of the mother's health, mental and physical, in etiologic relationship to congenital heart defects. When it is realized that the heart is perfectly formed, though in miniature, in seven weeks time from the date of conception, it will be apparent that maternal impressions cannot well be a causative factor, as is commonly supposed. With reference to physical illness of the mother during pregnancy, it is surprising how few mothers give any history of suffering any illness during this period. In one hundred examples of congenital defects of the heart, in the author's series, in a very large number, the parents and their families were free from rheumatic taint. In no case was there any evidence in this series of maternal rheumatic fever taking place during pregnancy. Therefore the commonest causes for endocarditis in children was conspicuous by its absence in this series.

Endocarditis in the fetus has been attributed to typhoid fever, influenza, pneumonia and other maternal infections. But the cases of such infections are infrequent in comparison with the number of cases of fetal endocarditis for which no explanation is forthcoming. It would appear that the placenta is able to be penetrated, and the fetus infected by microorganisms and toxins, quite apart from maternal indisposition. The fact that the endocarditis is frequently of the sclerotic or chronic variety, perhaps favors its toxic origin.

Syphilis, of course, is frequently supposed to stand in etiologic relation to congenital heart lesion, but in reality, it does not seem to be a very important factor. Thus, Hochsinger found congenital heart disease only seven times in five hundred cases of congenital syphilis. There is, however, some evidence to prove that malformation of the cardiac valves may be associated with spirochæte infection. It would appear possible that the virus of syphilis exerts a two-fold influence, *viz.*: by the action of the poison on the endocardium with the production of fetal endocarditis and by its action as a producer of malformations without endocarditis.

There is strong presumptive evidence that alcohol has a decided influence in the production of deformities as evidenced by clinical experience and experimental observation on lower animals. Cases of fetal endocarditis, inflammatory in character, are not at all rare. Thus in the production of congenital heart lesions two distinct processes can be seen in action; developmental disturbance and inflammation. Each can operate without the other and both are frequently combined. The results of fetal endocarditis are seen in the shape of sclerotic valves and on these valves it is not uncommon to find recent endocarditic vegetations. In association with developmental anomalies, the mitral and tricuspid valves are often thickened, though still efficient, suggesting that they have undergone a mild endocarditis during fetal life. It is in stenosis of the pulmonary artery that valvulitis and anomaly are most frequently combined. It is, however, only in a small proportion of the cases of congenital defect that endocarditis, limited to the valves, can be viewed as the cause of the disease, arising after the heart has been completed. Most cases of heart abnormality appear to be due to developmental error.

Morbus Cæruleus. Not all children with congenital heart lesion are blue, and all gradations of cyanosis may be noticed. In the majority of cases of blue children, the cyanosis dates from birth, though in some cases it does not make its appearance until after an attack of one of the exanthemata. Paroxysmal increase of blueness is at times a symptom. Sudden increase of cyanosis is very apt to be followed by convulsions.

By far the most common malformations of the heart in association with cyanosis are those cases where the pulmonary artery or the conus are either absent, rudimentary or constricted. Next in frequency is transposition of the pulmonary artery and aorta.

Clubbing of fingers and toes. This depends almost entirely on congestive swelling and thickening of the soft parts of the terminal phalanges. The osteo-arthropathies are doubtless toxic in origin. The most common blood change is polycythemia. In one of the author's cases, the red cells numbered 7,880,000 per c.cm. and the hemoglobin was 122%.

Dyspnea is not uncommon in morbus cæruleus and cardiac pain with angina-like attacks has been noted. Congenital heart murmurs are of various characters, being, however, more often harsh than soft. Such murmurs especially if conducted over wide areas, when heard in children under three years of age are usually congenital. These murmurs are most often systolic. The peculiar rumble carried through systole and diastole usually indicates either a patent ductus arteriosus or a communication between the pulmonary artery, and the aorta. Thrills are not rare. A systolic thrill of greatest intensity at the second left interspace and conducted towards the corresponding clavicle is pathognomonic of patent arteriosus. The most common of all cardiac malformations are defects in the ventricular septum, though such defects are rarely found alone. The most common combination is pulmonary stenosis, deviation of the aorta to the right and patent septum. The most common situation for septal defect is just beneath the aortic valves. Changes in the heart muscle do not necessarily follow septal defects, but hypertrophy and dilatation of the right heart are common. The systolic bruit which usually accompanies this defect is ordinarily to be heard all over the chest, back and front. The bruit is apt to vary in posture, and as to its area of maximum audibility. An important feature in the diagnosis is the detection at the apex of a healthy first cardiac sound audible though

the bruit and the tactile sensation accompanying it of the mitral valvular snap.

Defects in the interauricular septum. Patent foramen ovale is very common, and when slight can hardly be looked upon as an anomaly. It is usually associated with other defects. Open foramen ovale occurs in association with stenosis and atresia of the pulmonary artery, transposition of the great vessels and occlusion of the tricuspid orifice. This defect is very difficult to diagnosticate because of absence of characteristic signs. These septal defects become of consequence if the auricles act unequally so that there is an overflow to the right auricle with stasis in the systemic veins.

Stenosis and atresia of the pulmonary region. Stenosis of the pulmonary region is a common defect occurring nearly three times as frequently as atresia. In stenosis, there is associated stenosis of the conus arteriosus in 90 per cent. of the cases. The bruit of uncomplicated pulmonary stenosis is systolic and best heard over the second left interspace close to the sternum, or on the third costal cartilage. It is carried up to the left clavicle, but not heard in the carotids, unless there be an associated patent septum ventriculoum. X-ray examination may be of value in showing an enlarged pulmonary artery and patent ductus arteriosus. The prospect of life in these cases varies according to the defect. In atresia with closed septum the children die in infancy. If the septum be patent the child may live a few years. In stenosis with closed septum middle age may be reached. A very common complication of pulmonary stenosis is pulmonary tuberculosis.

Ductus Arteriosus. Obliteration of its channel usually takes place within a month. Permanent patency of the duct as an isolated lesion is very rare. The characteristic rumbling murmur, systolic, is heard loudest in the second or third left interspace close to the sternum. A thrill may be felt but is not constant. But in patent ducts of small calibre physical signs do not occur. (The author here reports in detail several cases where the probable diagnosis of patent ductus was made with the reasons therefore.) Reviewing the morbid anatomy of the congenitally deformed heart, closure of this fetal channel appears to be about the only thing possible in the way of a cure open to these cases. Coarctation of the aorta is the name given to stenosis or atresia of that vessel either at or below the isthmus, that part of the artery which lies between the left subclavian and the ductus arteriosus. Two types, the infantile and the adult, have been described. It is probable that patients may live long with this lesion which is often not to be recognized.

Congenital aortic stenosis and atresia are much rarer than corresponding lesions of the pulmonary artery. The cases of aortic atresia do not live longer than a few weeks. Aortic valvular stenosis is liable to be complicated by endocarditis and many cases of aortic disease in children are in reality congenital.

Hypoplasia of the aorta is characterized by diminution in size of the aorta and arteries throughout the body, the walls of the vessels being thin and elastic. Virchow discovered that chlorosis, hypoplasia of the arterial system and a small heart are commonly combined. In these cases there is also an underdevelopment of the sexual system. In these cases there may be hypertrophy of the heart at puberty. The period of danger in these cases is thus the period of adolescence, when heart failure is not unlikely to occur. Defects in the auriculo-ventricular valves occur but are very rare.

Hypertrophy of the heart undoubtedly arises as an idiopathic disease of congenital origin. Various cases are on record.

Cardiac displacements—dextrocardia or mesocardia—do occur at times. Dextrocardia usually accompanies transposition of the viscera.

(Illustrative cases are given throughout the lecture to explain the defects of the various classes alluded to. For those interested in the subject, this lecture will be of the greatest value. Full bibliography is appended.—ED.)

OBITER DICTA FROM FOREIGN JOURNALS.

"WAIT TILL YOU COME TO FORTY YEAR."

When Thackeray wrote his disillusioning poem "The Age of Wisdom," with its plaintive refrain, "Wait Till You Come to Forty Year," he gave a clever pen-picture of that phase in a man's life when the last foot-steps of youth are faintly heard and the first footfalls of the beginning of old age are just perceptible. Of course, his account of how a man feels was evolved from a sentimental and literary conception of the momentous crisis in a man's life, but as such it has enough psychology to prove interesting even to those neurologists who imagine that psychology is synchronous with the discoveries of recent years. Dr. Maurice de Fleury, being a scientific physician, delves even deeper than the English novelist, and by leaving sentiment out altogether from his portraiture of the man of forty, throws on the medical canvas a picture of light and shade that is much more encouraging than neurologists and sentimentalists are in the habit of giving us. The sanity of his words is quite admirable, and when we say that his communication was among the best at the meeting of the French Academy of Medicine on December 21st, 1909, sufficient praise has been awarded. The following is an almost literal version of his sagacious medical essay:

It happens not infrequently that a man of forty or more, hitherto in enjoyment of perfect health,—alert, eager to work, and not fearful of the consequences of junketings,—suddenly feels that without any apparent cause his whole being is undergoing a change. This condition, which is really one of premature aging comes on so rapidly, that it reaches its apogee after the space of a few weeks. Fortunately, the disturbance is only transitory and leaves behind but slight traces of its once having been present. This crisis in a man's life which impresses the casual observer as a matter of old age is usually ushered in with digestive disturbances: atonic dyspepsia, pyloric spasms, persistent constipation, distention in the epigastric region, congestion of the face after eating, dyspnea on exertion, and panting, whether steps are being climbed or a short walk undertaken. A feeling of lassitude overwhelms the patient and he complains of his muscles being so stiff that all movements are difficult. Apparently the normal equilibrium between his strength and endurance, and the weight of his body, is so decidedly destroyed that he can hardly hold himself erect or drag his feet along. At night he suffers from insomnia, and by day somnolence is present. He suffers from unremitting aches which manifest themselves in persistent headaches, constriction of the temples, and untoward sensations in the nape of the neck: occurrences aggravated by a strange feeling as if his brain was empty. At times he may have nocturnal cramps, and the phenomenon of "dead fingers." His sclerae turn yellow; his complexion has a purplish hue; and his stoutness assumes the appearance of bloatedness. From time to time, he experiences in the precordial region, agonizing pains which recall to him a typical case of angina pectoris, especially if he is a smoker. Following a recent attack of the grip he may be host to sibilant rales which, to his uninitiated ears,

seem like the exact symptoms of asthma. He may discover a hemorrhoidal lump and note with considerable agitation that the veins in his lower extremities are unduly enlarged. He is not without palpitations of the heart, flushing of the face, and cold feet. His normal sexual desire is on the wane to so great an extent that the sexual act loses all its attractions. This is followed by lumbago, mental depression, and even remorse; and what with the thought that his testicles hang lower than usual and the fear of impotence, his condition of general atony is greatly increased. His urine, voided at rare intervals, is cloudy and forms a deposit at the bottom of the vessel.

Somewhat later he is surprised at his lack of enthusiasm for work. The simplest tasks, which formerly exacted no great effort, are now performed only after arduous endeavors; a letter to a tradesman, a conversation on conventional lines, are effected with difficulty. His memory is not as reliable as it should be; proper names and dates are not readily remembered; and instead of his vocabulary being inclusive of many words it dwindles down to a small number, and they are used apprehensively. And when it is a question of taking a decisive stand in an important matter, what happens? His will power, formerly so dependable and so ready at hand, gropes in an attempt at estimating the pros and cons, and the result is that he has ere long a hundred pretexts to justify his indecision. Hitherto proof against allurements, courageous and candid, he develops a timidity that prevents his looking his interlocutor in the eye; and even when he meets an old friend in the street he avoids speaking to him by turning away. His features have a tired and worn expression, his stooping figure indicates fatigue, and he is painfully conscious that everybody is aware of the change he has undergone.

In face of minor difficulties, he is infirm of purpose; for the spectre of fear is uppermost in his mind; his pessimism as regards his condition increases and already he sees all his wealth melted away. With his relatives he is ill at ease and though there should be no ceremony between them, his nervousness is increased by attempts at formality. He is given to superstition. His unhappiness is so dominant that even a casual observer must know that he craves sympathy. But as his appetite is very good, going even to the lengths of gluttony, the aforesaid casual observer laughs at his depressions. This sort of attitude makes him desperate, at times; hence to command the sympathy that he thinks his just due, he makes out his case as the most touching of all unfortunate conditions, by complaints that will not be downed. And by giving utterance to his woes, he feels that he is justified in thinking that his case has already reached a hopeless stage. For his thoughts are concentrated on self; and the narrowing of his mental vision results in the sort of sadness which readily passes from depression to tears and sobs, the sobs of a very young child. But, above all, he is prey to the fear that he is bound to acquire every disease of which he has ever heard.

It is important to note here that this mental state, composed as it is of sadness and fear, is really secondary, chronologically speaking, to the somatic signs which may be grouped under digestive, muscular, respiratory and genital troubles, and which antedate the moral cataclysm by two or three weeks. Psychic depressions manifest themselves only after the organs of the body have sent their complaints to the brain while in a state of fatigue, or suffering, or lowered functioning.

The condition of languor varies from day to day, sometimes in the same day, according to the fullness or emptiness of the stomach, and the phsyic phase through which the patient may be passing. News that is agreeable

and an event that has the power to make for happiness, have a beneficent influence, but these are nothing, as regards happy results, by comparison with sunshine and good digestion. In the morning he is invariably downcast, spiritless, prone to complaints and tears; at night, when he happens to be in a well-lighted room, his condition improves so much that conversation becomes natural, and smiles are not lacking. He then expatiates on his well-being and will not brook any reference to his supposedly lamentable condition.

No doubt he has consulted many doctors. Some have said: "You have no organic lesions; you are in a nervous state; do not think of it." Others have expressed the opinion that "it is the crisis incident to the incipency of old age; many men pass through it; this will go as it came." And all along he searches for a remedy which shall be more efficacious than these second-rate words of consolation.

Without much ado the reader will say that the description just given is that of a commonplace case of neurasthenia; the man is "the imaginary invalid" with symptoms characteristic of similar conditions at fifty; a few days of repose, some careful feeding, douches, psychical re-education will effect a cure. Surely, how can such a case be other than commonplace? and was it really necessary to describe it, when discussing the on-coming of old age, as if it were a strange morbid type?

Truth to say, the patient is not a neurasthenic, as generally understood, nor is he a hysteric, for in vain you would search for the physical and mental stigmata indicative of suggestibility. He is not a psychasthenic, since the nervous troubles are not old but very recent; since heredity is of no moment, and his past, though minutely examined, does not reveal any of the characteristic symptoms of the psychosis named for Pierre Janet.

Since I began to treat nervous diseases, I have seen, in the last fifteen years, 201 cases similar to the one just described, and have made a point to keep all my patients under observation for many weeks, in fact throughout the whole treatment. In all, the nervous upheaval occurred unexpectedly, after forty years of complete exemption from all neuropathic accidents. In fact, all these cases are diametrically opposite to those described by Dubois, since the characteristic of the latter is dominant fear, a condition hovering around nosophobia. The cases I saw were men who had been active and confident of their powers, enthusiastic as to work and recreation, convinced beyond a doubt of their strength of character to withstand criticism or ordinary physical disturbances. They ridiculed those who were given to exaggerating slight ailments, and not until physical depression had set in did they manifest the neuropathic mental state. Another differential sign, and one not without significance, is the fact, that these forty-year old patients are decidedly rebellious to psychotherapeutic treatment; at least during the first weeks and while their mental state has not as yet become habitual. Of the 201 patients treated by me, 72 had at one time been in sanatoria or private hospitals. They had been treated by the douche, rest in bed, frequent feeding and moral re-education. But despite the good that accrues from isolation, removal from customary haunts, rupture with engrossing matters of business, and from change of air and perfect repose, not to mention the persuasive eloquence of the attending physician, almost all returned home in the condition in which they entered the institutions.

Now all this was due to the fact that the attention of the attending physician was concentrated on his patient's mind, to the exclusion of even once examining the urine for the sake of analysis. To comprehend this singular nervous disturbance it is necessary to examine each patient with

care. Certain neurologists shrug their shoulders when mention is made of the condition of the heart, blood-vessels, stomach, intestines, liver, and the kidneys in neuropaths. A mental analysis of the patient constructed, in a sense, out of preconceived doctrines suffices to convey to them a complete understanding of the case. I am of opinion that this is insufficient and that neurologists deceive themselves by attaching too much importance to the matter of psychology, thus overlooking the somatic signs which to the general practitioner are of considerable moment.

I shall now proceed to give the symptoms of the neurasthenic who is passing through the critical period which portends his entering on the last period of his life—old age. With few exceptions the stomach will be distended, at times dilated; there will be atony of the intestines, tumefaction, with tenderness, of the left lobe of the liver, relaxation of the abdominal walls, occasionally a floating kidney, a fatty and weak heart, or even an aortic orifice showing signs of sclerosis; varices, hemorrhoids, and varicocele; exaggerated arterial tension in those who are approaching arteriosclerosis; a lowered tension in others; increase in the venous and often in the portal tension; a stubborn eczema, obesity, and some pulmonary emphysema. A complete analysis of the urine passed in twenty-four hours, with due regard to the weight and size of the patient, will reveal the importance of undertaking this examination, and, moreover, will furnish some interesting data to guide the practitioner in his treatment of the case.

In truth, is it strange that a brain that is continually irrigated with blood charged with bile and the debris from intestinal putrefactions, should not always be in a state that tends towards happiness? Ought we to be surprised to find a mind, unremittedly registering impressions of fatigue and pain and functional impotence via the sensory nerves, the splanchnic organs and all the muscles necessary to vocations and avocations, quite incapable of grasping things, achieving happiness, and reaping the beneficial results of euphoria? Is it possible to conceive a different and happier state for a mind thus enthralled? And with this thought ever before me, I have vigorously pursued a treatment that is completely severed from psychotherapy, but has for its object the combating of defective nutrition and excessive fatigue. In other words, minute attention is paid to cause and effect.

Imprimis, I abstain altogether from moral re-education. On the other hand, a thorough cleansing of the internal organs is instituted. When the kidneys are slightly affected (dietetic albuminuria, desquamation and oxaluria) a milk diet is prescribed; then skimmed milk or milk greatly diluted with alkaline waters is ordered, followed by a milk and vegetable regimen. In some cases vegetables and fruit are given, careful mastication being advocated, and only on the empty stomach are liquids allowed, and then, generally, in the form of abundant diuretic drinks. Lactic ferments, on account of their power to combat constipation and indicanuria, are prescribed, and hypochlorization of all aliments should not be overlooked. After two or three weeks of this treatment a return to the normal diet may be undertaken, though from now on the amount of meat should be curtailed. Hydrotherapy (warm bath), moderate massage, and above all walking in the open country, are indispensable complements of the treatment.

On account of the number of admirable works on pathologic physiology, which have been published in France and other countries in the last thirty years, the neurologists of standing have acquired the habit of attaching great importance to the psychologic analysis of all

cases of psychoneuroses which come under their observation. For hysterics and psychasthenics nothing is better. But if the case is one of true neurasthenia, especially the sort that occurs in a man at the age of forty, and carries all indications that the subject is laboring under what may be termed "the on-coming of old age," psychology is really of secondary importance. Has not a distinguished surgeon demonstrated the peripheric origin of a number of psychoses? And is it doing a wrong to psychology to say that the physical reactions on the mind are matters of considerable importance?

It is within the bounds of reason to assert that since there are psychoneuroses in which the somatic symptoms are dependent on a fixed idea or suggestion, there surely may be other cases in which the mental state is but a matter of an obscured conscience, or, in other words, the reaction of a primitive somatic state on the mind. For these cases, allow me to say, the neurologists ought to learn, above all, to be physicians.

HISTORICAL NOTES.

HOW THE FOUNDING OF A HOSPITAL ORIGINATED THE ROYAL ACADEMY OF ARTS.

The association of art with hospitals is an interesting subject which is worthy of study, for not a few famous paintings are housed in institutions devoted to the care of sick and injured mortals. This relationship is possibly easier of comprehension than that the founding of a hospital should be the fount from which should issue a Royal Academy of Fine Arts. Nevertheless, the present Royal Academy grew out of the Foundling Hospital in London.

The idea of establishing this famous charity originated with Captain Thomas Coram (1668-1751), an English "mariner and shipwright," who lived for several years at Taunton, Massachusetts. The charter of the



Head-piece, made by Hogarth for the Foundling Hospital.

Foundling Hospital was granted by George the Second, on October 17, 1739, in response to the memorial of Captain Coram. The institution was established "for the reception, maintenance, and education of exposed and deserted young children." The Governors first opened a house in Hatton Garden, in 1740-41; fourteen years later the present hospital was built.

One of the earliest Governors was William Hogarth, noted then as a painter, but remembered more particularly for his great skill as an engraver and caricaturist. The income of the hospital not permitting the expenditure of money for decorations, Hogarth and other leading artists of that day voluntarily used their talents in the ornamentation of the

several apartments. The pictures thus secured were much admired by the public and drew many visitors to the hospital. The artists were accustomed to hold an annual meeting at the hospital. Originally their little society was of a political nature, but soon it turned its attention to the encouragement of the arts. At these annual gatherings the donations of pictures were received, examined and discussed. So much interest was excited that the artists determined to hold a public exhibition of their works. This was opened April 21, 1760, in a large room, in the Strand, and was favorably received by the public. The movement grew rapidly and led to the formation of the Royal Academy in 1768.

Sir Robert Strange remarks that "Accident has often been observed to produce what the utmost efforts of industry have failed to accomplish and something of this kind seems to have happened here."

Hogarth's interest in the Foundling Hospital led him to give to it his time, his talents, and his money. The charter of the institution permitting the Governors to seek alms, Hogarth's first artistic contribution to the hospital was a "head-piece" (see illustration), which was attached to the subscription list. The original plate is now in the possession of the hospital. The description of this engraving is as follows:

"The principal figure is that of Captain Coram himself, with the Charter under his arm. Before him the beadle carries an infant, whose mother having dropped a dagger with which she might have been momentarily tempted to destroy her child, kneels at his feet, while he, with that benevolence with which his countenance is so eminently marked, bids her be comforted, for her babe will be nursed and protected. On the dexter side of the print, is a new born infant left close to a stream of water which runs under the arch of a bridge. Near a gate on a little eminence in the pathway above, a woman leaves another child to the casual care of the next person who passes by. In the distance is a village with a church. In the other corner are three boys coming out of a door, with the king's arms over it, with emblems of their future employment; one of them poises a plummet, a second holds a trowel, and a third, whose mother is fondly pressing him to her bosom, has in his hand a card for combing wool. The next group, headed by a lad elevating a mathematical instrument, are in sailors' jackets and trousers. Those on their right hand, one of whom has a rake, are in the uniform of the school. The attributes of the three little girls in the foreground—a spinning wheel, a sampler and broom—indicate female industry and ingenuity. It should be remarked that the designs of the Hospital, foreshadowed by this interesting engraving, did not come into actual operation till two years afterwards."

In May, 1740, seven months after the charter had been granted, Hogarth presented to the Foundling Hospital a full-length portrait of Captain Coram—a canvas in which the painter took a particular pride. "If I am so wretched an artist as my enemies assert," wrote Hogarth, "it is somewhat strange that this, which was one of the first I painted the size of life, should stand the test of twenty years' competition, and be generally thought the best portrait in the place, notwithstanding the first painters in the Kingdom exerted all their talents to vie with it."

The rival portraits here alluded to are, George the Second, by Shackleton; Lord Dartmouth, by Reynolds; Dr. Mead, by Ramsay, etc., etc.

These and many other donations have caused an art critic to write, "that it is within the walls of the FOUNDLING the curious may contemplate the state of British art, previously to the epoch when George the Third first countenanced the historical talent of West."

BOOK REVIEWS.

HAND-BOOK OF DISEASES OF THE RECTUM. By Louis J. Hirschman, M. D., Fellow American Proctologic Society; Lecturer on Rectal Surgery and Clinical Professor of Proctology, Detroit College of Medicine, etc. 384 Pages. Price, Cloth, \$4.00. With 147 illustrations, mostly original, including two colored plates. St. Louis: C. V. Mosby Medical Book & Publishing Co. 1909.

This is an opportune book for the reason that it fills a long-felt want. It is preëminently a teaching book, such as the general practitioner most needs, for the reason that the diseases of the rectum and anus are not, for the most part, taught intelligently in the medical colleges.

The keynote of this book is practicability. The author's experience in conservative rectal surgery and as a class teacher, has taught him to recognize the needs of the general practitioner, and in the preparation of this work, the essentials of diagnosis and descriptive technique have been kept in sight.

The publishers have done their work in a way that commends itself to the profession.

HANDBUCH DER GYNAEKOLOGIE. Herausgegeben von Professor J. Veit in Halle. Zweite voellig umgearbeitete Auflage. Vierter Band. Erste Haelfte. Verlag von J. F. Bergmann in Wiesbaden. Preis: Mk. 16.60.

This volume of 550 pages is entirely devoted to a consideration of the diseases of ovarium and parovarium. In collaboration with Dr. Kroemer, of Berlin, it has been written by Dr. J. Pfannenstiel, of Kiel, who, only a few weeks, ago, succumbed to an acute septic infection. No worthier and abler man could have been found to deal with this subject, and no other man could have succeeded better in presenting it in such a thorough and complete manner, dealing equally well with the scientific and practical aspects of the important and intricate problem of classification and treatment of ovarian diseases.

A MANUAL OF OTOTOLOGY. By Gorham Bacon, A. M., M. D., Professor of Otology in the College of Physicians and Surgeons, Columbia University, New York. With an Introductory Chapter by Clarence J. Blake, M. D., Professor of Otology in the Harvard Medical School, Boston. New (5th) edition, thoroughly revised. 12mo, 500 pages, 147 engravings and 12 plates. Cloth, \$2.25, net. Lea & Febiger, Philadelphia and New York, 1909.

That this manual of Otology has gone through five editions speaks well for its usefulness as well as its popularity. The advantage of successive editions and revisions is well exemplified in the reading matter. The style is clear and concise and the whole book a model of compactness. It is intended primarily as a manual for students, but should be of great value to the man in general practice as well. To the specialist its value would be more questionable as much of the subject matter is too condensed and fragmentary to afford the information desired. The difficulty of providing a book suitable to all readers is at once apparent and Dr. Bacon has done well to set out with one definite aim and to cling consistently to it. Dr. Blake well says in his introductory chapter that "the demand for elaborate text-books has resulted in their numerous production, and at the same time has awakened both in the student and the practitioner the desire for more compact compilations which afford in a small and conveniently accessible compass the information most desirable from a practical point of view."

The present book contains much of value which has come into use since the last edition was published. The author recommends very decidedly the enucleation of the tonsils in preference to tonsillotomy. The former operation seems to be the operation of choice of the American profession at least to day. The sub-mucous resection of the septum is also carefully described.

To us it seems questionable to include chronic catarrhal otitis and otosclerosis under the same pathological entity and to discuss them together. This is hardly the view of the majority of otologists at the present time. Such discussion, too, must leave in the mind of the student a rather confused picture of the conditions at hand. Certainly a discussion of these two conditions in separate chapters would have conduced more to clearness. More space might also well have been given to the chapter on otitis interna.

The chapter on nasal diseases is clear, concise, and well included in a work of this character. It is rather difficult to see, however, how any man at the

present stage of nasal surgery can recommend the Asch operation for deflections of the septum. The objection to the sub-mucous resection is that it is an operation that requires special skill while "for the surgeon who operates infrequently and for one of limited experience, operations of the Asch type are indicated." The same line of reasoning might prompt the practitioner to perform tonsillotomies in preference to referring his cases to the specialist for tonsillectomy. If the otologist is not a rhinologist as well, he should not attempt nasal surgery but should refer such cases to some man more competent to care for them.

The above criticisms, however, are but slight objections to a work of such uniform excellence. We can recommend the book most heartily, first of all and more especially to the student, but also to the practitioner. Not the least helpful feature of the manual are the many excellent illustrations.

ACTION DE LA CONTRACTION UTERINE SUR L'ŒUF HUMAIN. Par Dr. Paul Bouquet, Médecin de la Maternité de Brest. Paris: G. Steinheil, Éditeur. Prix: 10 fr.

In this volume the mechanical effect of uterine contractions upon the ovum is discussed in a most interesting manner. How thoroughly and methodically the author handles his subject is best shown in the "Table Synoptique," with which the volume closes. Beginning with the implantation of the ovum, he considers next the development of the fetus. He describes the effect of the painless contractions of pregnancy on the fetus, the membranes, both the normally and low inserted placenta, on the lower uterine segment, and so forth. The last part of the volume takes up labor itself. Here again, in the most systematic manner, the various mechanical results of uterine contractions are described as exerted upon the child, membranes, and all the portions of the birth canal, both under normal and abnormal conditions.

The illustrations are given on 44 special plates appended at the end of the text matter.

This monograph contains an enormous amount of interesting and partly new facts pertaining to the mechanism of labor, and, if this term seems permissible, to the mechanism of pregnancy.

LEHRBUCH DER OHRENHEILKUNDE FUER AERTZE UND STUDIERENDE. Von Dr. Paul Ostmann, A. O., Professor der Medizin, Director der Universitäts-Poliklinik fuer Ohren, Nasen und Halskranke zu Marburg A. Lahn. Mit 100 Abbildungen, 43 Kurven und 51 Hörreliefs. F. C. W. Vogel, Leipzig.

This book of five hundred and fifty pages, is excellently printed on paper of good quality. Like most foreign scientific works, it is bound in paper. As stated by the author in his preface, the book is divided into two main divisions—a general and a special.

The general division of one hundred and eighty-four pages deals with the general diagnosis, symptomatology and therapy of ear diseases and concludes with a history and description of the various operations on the ear.

The special part discusses in order the diseases of the external ear and canal, the tympanic membrane, the Eustachian tube, the tympanic cavity and its complications, and the diseases of the labyrinth. Under this second part, too, is included a discussion of the ear complications as occurring in general systemic affections. This is a subject often too little touched upon in works on otology, and to us seems to be deserving of special mention and attention. The otologist is too frequently tempted to view the ear condition apart from the general condition of the patient and in his interest for the part, to forget the whole.

In a notice so brief, it would be impossible to do justice to a work of so commendable a character as this of Dr. Ostmann's, or to mention the various and many points of excellence. The author has purposely omitted the usual chapters dealing with the gross and minute anatomy of the temporal bone. This seems to us to be a wise omission, as such information can be readily gained from various purely anatomical works. There seems no good reason for repeating these anatomical descriptions in every work on otology published. He has not failed to give sufficient of the surgical anatomy to make his discussions and descriptions perfectly lucid.

The various operations on the mastoid are clearly described and are preceded by a brief history of the surgery of the mastoid, as well as a concise and clear statement of the indications of the various mastoid operations. The chapters dealing with the diagnosis of diseases and operations upon the labyrinth are hardly up to the high standard maintained by the rest of the book. The work of Barany, although alluded to, is hardly given the importance it deserves in the diagnosis of involvement of the labyrinth.

Altogether the book may be highly commended and, as the author intends, should be of value both to physicians and students.

SEMI-INSANE. By Grasset. Translated by Ely Smith Jelliffe, M. D. Funk & Wagnalls, New York.

This is a translation of Grasset's well known monograph on semi-insane. Grasset's work on this subject has become well known, chiefly from the medico-legal point of view; his contention is that there is a class whom the courts do not recognize as irresponsible but who medically are without doubt to be considered in a class apart. To this class of individuals Grasset has given the term of semi-insane, implying that their responsibility is subject to tradition and that therefore their punishment, in case a crime is committed, should likewise be proportioned to their degree of responsibility.

The translation of this book has been very well done and seems singularly free from error, though a comparison between the original shows in places more liberal interpretation of the French than seems necessary. One is chiefly impressed, in reading Grasset's work, by the masterly presentation of his facts and the unerring logic of his conclusions derived from them. Such a book as this should be read with great care, not only by physicians who have an interest in medico-legal subjects, but by jurists before whom such cases constantly appear.

STUDIES IN PARANOIA. By Gierlich and Friedman. Published by the JI. of Nervous and Mental Diseases. Monograph Series No. 2. New York.

This is the second of the monographs published by the Journal of Nervous and Mental Diseases in the efforts to place before those interested in psychiatry, in a compact form, some of the more recent works on special topics in psychology. The translation of this monograph is well done and presents the subject of the modern conception of paranoia in a clear, readable and interesting way. This monograph can be unhesitatingly recommended, both for its clear presentation of the subject and for the interesting way in which the subject matter is laid before the reader.

BOOKS RECEIVED.

LA CURE RADICALE DE LA HERNIE INGUINALE. PAR LE DOCTEUR LUCAS-CHAMPIONNIERE. Paris. G. Steinheil, Editeur. 1909. Prix: 3 fr. 50.

LEHRBUCH DER PHYSIOLOGIE DES MENSCHEN. HERAUSGEGEBEN VON N. ZUNTZ UND A. LOEWY IN BERLIN. Mit 300 Abbildungen und 2 Tafeln. Verlag von F. C. W. Vogel in Leipzig. 1909. Preis: 24 Mk.

DISEASES OF THE HEART. By James Mackenzie, M. D., M. R. C. P. Second Edition. Oxford University Press, American Branch 35 West 32nd Street, New York, 1910. Price \$5.50.

SPONDYLOTHERAPY. By Albert Abrams, A. M., M. D. San Francisco, Cal. The Philopolis Press, Suite 406 Lincoln Building, San Francisco, Cal. Cloth, 420 pages, 100 illustrations; price \$3.50.

"INFECTIOUS DISEASES." A Practical Text-Book by Claude Buchanan Ker, M. D. Ed., F. R. C. P. Ed. Medical Superintendent, City Hospital, Edinburgh, and Lecturer on Infectious Diseases to the University of Edinburgh. London—Henry Frowde Oxford University Press, Hodder & Stoughton, Warwick Square, E. C. 1909.

HEART DISEASE BLOOD-PRESSURE AND THE NAUHEIM-SCHOTT TREATMENT. By Louis Faugeres Bishop, A. M., M. D. Clinical Professor of Heart and Circulatory Diseases, Fordham University, School of Medicine, New York City; Physician to the Lincoln Hospital; Late Chairman of the Section on Medicine of the New York Academy of Medicine; Member of the New York Pathological Society; Alumni Association, St. Luke's Hospital, etc. Third Edition—New York, E. B. Treat & Company. Price \$3.00.

PREVENTABLE DISEASES. By Woods Hutchinson, A. M., M. D. Author of "Studies in Human and Comparative Pathology," "Instinct and Health," etc., etc.

Clinical Professor of Medicine, New York Polyclinic, late Lecturer in Comparative Pathology, London Medical Graduates College and University of Buffalo. Boston and New York. Houghton Mifflin Company. The Riverside Press Cambridge. 1909. Price \$1.50 net.

TEXT-BOOK OF MEDICAL AND PHARMACEUTICAL CHEMISTRY. By Elias H. Bartley, B. S., M. D., Ph. G. Professor of Chemistry, Toxicology, and Pediatrics in Long Island College Hospital; Late Dean and Professor of Organic Chemistry in the Brooklyn College of Pharmacy; Late Consulting Chemist to the Department of Health of the City of Brooklyn; Late President of the Board of Pharmacy of the County of Kings; Member of the American Pharmaceutical Association; of the American Chemical Society; Fellow of the American Association for the Advancement of Sciences, etc. Seventh Revised Edition, with Ninety Illustrations. Philadelphia, P. Blakiston's Son & Co., 1012 Walnut street. 1909. Price \$3.00 net.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles on Treatment, Medicine, Surgery, Neurology, Pædiatrics, Obstetrics, Gynæcology, Orthopædics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene, and Other Topics of Interest to Students and Practitioners. By Leading Members of the Medical Profession Throughout the World. Edited by W. T. Longcope, M. D., Philadelphia, U. S. A. Volume IV. Nineteenth Series, 1909. Philadelphia and London: J. B. Lippincott Company. 1909.

DIET IN TUBERCULOSIS, WITH COSTS OF FOODS AND THEIR PREPARATION. By Noel Dean Bardswell, M. D., M. R. C. P. and John Ellis Chapman, M. R. C. S., L. R. C. P. Price \$1.00. Oxford University Press, American Branch, 35 West 32nd street, New York. 1910.

MALE DISEASES IN GENERAL PRACTICE. An Introduction to Andrology. By Edred M. Corner, M. A., M. C. (Cantab), B.Sc. (Lond.), F. R. C. S. (Eng.) Surgeon to the Children's Hospital, Great Ormond Street Surgeon to St. Thomas's Hospital, in Charge of Out-Patients Surgeon to the Isolation Wards, Teacher of Operative and Practical Surgery, St. Thomas's Hospital Consulting Surgeon to the Wood Green and Purley Hospitals, Member of the Board of Advanced Medical Studies in the University of London. London—Henry Frowde Oxford University Press—Hodder & Stoughton, Warwick Square, E. C. 1910.

URGENT SURGERY. By Félix Lejars—Professor Agrégé à la Faculté de Médecine de Paris Chirurgien de l' Hôpital Saint-Antoine, Membre de la Société de Chirurgie. Translated from the Sixth French Edition by William S. Dickie, F. R. C. S. Surgeon North Riding Infirmary, Middlesbrough; Consulting Surgeon Middlesbrough Union Infirmary; Consulting Surgeon Eston Hospital. With 20 Full-Page Plates and 994 Illustrations, of which 602 are drawn by Dr. E. Daleine and A. Leuba, and 217 are from Original Photographs. Vol. 1. Introductory—Head-Neck-Chest-Spine-Abdomen. New York: William Wood and Company. 1910. Cloth \$7.00 net. Half Morocco \$8.00 net.

CONSTIPATION AND ALLIED INTESTINAL DISORDERS. By Arthur F. Hertz, M. A., M. D. Oxon, M. R. C. P. Assistant Physician, Physician in charge of the Electrical Department and Demonstrator of Morbid Anatomy at Guy's Hospital; Formerly Lecturer on Pharmacology at Oxford University and Demonstrator of Pharmacology and Physiology at Guy's Hospital; Formerly Radcliffe Travelling Fellow of Oxford University. Henry Frowde, Oxford University Press; Hodder & Stoughton, Warwick Square, E. C. London, 1909.

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EDITORIAL.

WHEN DOCTORS ENGAGE IN LITERARY PURSUITS.

A striking illustration of the ineptitude of the medical mind for the exacting art of short-story writing has recently been evidenced to a degree that must mean discouragement for all those restless spirits in the ranks of medicine, who at present are longing to add to their medical honors the guerdons which they imagine are easily won, when their invincible ambition is allowed to caracole, after it has slipped its check-rein. Ambition, when applied to the making of novels whether long or short, has before now been shown to be rather poor stuff unless it was sustained by talent that stood foursquare, but such is the deep-rooted and engulfing weakness of human nature that the harshest lessons, derived from the experience of others, are unable to disturb the self-sufficiency inherent in man. That this deprecatory inattention to what has gone before has been repeatedly shown in the halting literary attempts of pretentious laymen, is no concern of ours here, since these columns are only for subjects germane to medicine; but what does concern us deeply and what unswervingly moves our sympathetic souls to pity, are the deplorable reiterations which doctors perpetrate on us—despite the many wrecks already recorded in the dangerous literary shoals—on account of their persistence in publishing medical stories. And no case of recent date is more flamboyant as regards those very palpable defects which smite the reader at once with the knowledge that an unmitigated error has been enacted than the short story, "Under the Microscope," which Dr. J. Bart Rous, Sub-editor of the *Lancet*, publishes in the March number of the *Strand Magazine*, and which appears to us as about the best illustration of how impossible it is for even an excellent writer on medical topics, to withstand the allurements contained in the offer of "a prize of £50 for the best medical story by a qualified medical man," though the talent for its making may be lacking.

A hypercritical frame of mind in juxtaposition with a story in a popular magazine is certainly not at all commendatory on the part of a critic; but even assuming a middling grade of mental acuteness, we must admit that for mediocrity and inanity, Dr. Rous will be in no danger of being compelled to yield the palm to competitors for many a day. It has been our fate, in our hours of leisure, to be brought in close relations with short stories on medical subjects, written by medical men and others; and while admitting that there was considerable maltreatment of the literary unities by the former, and the introduction of absurdities by the latter, there were at least a few out-of-the-ordinary points that deprived the tedium of some of its depressing exactions. But this instance of the art of short-story composition is so far removed, either from the hospital, with all those lurid lights which fascinate and convulse the inquisitive reader, or from the flights of the imagination, which are deemed necessary even by the lowly critical to raise a story out of the slough of commonplaceness, that astonishment waxes strong to think how utterly devoid of humor the author himself must be not to have realized that, with limitations which are his by reason of an intensity of seriousness which spells undiluted melodramatics, his offering would be an excellent contribution to humorous literature. Certainly a story that has for its pivotal interest the distressing mistake which arose from the "mixing up" of slides in a laboratory, whereby a poet was driven desperate because for some minutes his simple lingual ulcer was diagnosed as cancer, is a situation that is not foreign to those penny dreadfuls, which so often swerved our paths from the straight road of duty that should have led to school and studies, and in which we spent so many delightful hours poring over the hairbreadth escapes of much-maligned heroes and heroines.

Of the great weaknesses of mankind, the greatest surely is the desire to write. Just because a pen is ready to hand, it is supposed that the right impetus is always present; and though at times it may be lacking, what can be easier than to call it up by considerable wrinkling of the brows and much scratching of the head? No one ever thinks of rushing off to a paint-shop and buying a brush in the hope of painting a picture in emulation of Whistler or Edouard Manet, but nearly everyone who has written the conventional "Now I take my pen in hand, etc." at the beginning of a letter, imagines he has the divine fire. The art of literature has been a patient mistress, and has always been most lenient even to her greatest traducers. But though this ought to be well known to all physicians, and therefore appreciated by them to a greater extent than it is by the laity, since they, of all men, come in contact with unrelievable suffering almost daily, the facts proclaim that they have quite cheerfully

added their quota to her mental anguish. A vast array of lay offenders could be marshalled forth to prove our contention, were we inclined to go into the details of this harrowing situation. This is interesting as showing how indifferent to the tortures of another, lay writers may become through callousness. But though we might condone this offence when its perpetration is effected through ignorance of what supersensitiveness in another really stands for, should we withhold our commination when physicians are enthralled by a similar lure, and rush into print with stories that are "as hollow as a ghost, as dim and meagre as an ague's fit"?

WHO ARE THE ENEMIES OF THE MEDICAL PROFESSION?

A question which has often caused considerable agitation in medical circles, especially among the sensitive, is the not unimportant one as to who are the individuals who have been the greatest offenders in the matter of bringing the science of medicine into disrepute. Physicians, who have given the matter some thought, have not been loth in declaring that the enmity, which has been to a considerable extent responsible for the undoing of our prestige, has invariably come from without: that is, the bludgeonings cast on our bowed heads are the castigations of an ignorant public in a state of inappreciation of our high values. That this has always appeared to be the easiest explanation, does not make it necessarily the most truthful one; and that other causes may be at work in effecting a blackening of our reputation as models of propriety and morality, merits consideration, if only we can ascertain the truth and make some headway, despite a foolish unwillingness on our part to declare our very human weaknesses. A critic has recently arisen, a Frenchman, by the name of Gaston Pasquier, who in his thesis "*Les ennemis de la profession médicale*," prepared for his doctorate and read before the Faculty of Paris, has been courageous enough to make mention of the real causes which he conceives, as the undermining processes of reputations we are at such pains to garnish with the attributes characteristic only of the lofty. His summation of the principal causes undoubtedly shows that they come from within our own ranks, instead of from without; a disappointing statement, to be sure, for all those who have hitherto plumed themselves on the correctness and inviolability of their laments.

In what spirit does this new historian of our rather deplorable manner of life, as instanced in numerous cases, approach the subject? and, Is his critical attitude born of too much narrowness to be entirely free from the drawbacks of a visionary? We hasten to assure the reader that he

need fear no such thing as prejudice or undue Utopian ideas from the writer, for though he might have scored our moral failings with words etched in acid, he makes no mention of them but takes up the most common failing characteristic of all mankind—namely, the propensity to talk too much on subjects which should be as sacred as Pandora's box before it was opened. Gossip has from time out of mind been considered an ignoble weapon with which to ruin an enemy, but how utterly despicable it is, when its elusiveness—and whoever was gifted enough to trace the source of gossip?—is used as the best means whereby to discomfort patients and make defamatory attacks on doctors under cover! Have not all of us been witnesses to the turmoil in communities caused by what some indiscreet doctor has merely "mentioned" to a congenial spirit, just to enliven the monotony of conversation and to be thought "a real man with so shrewd an outlook on life that success is surely his for the asking?" The instances, in which physicians make laymen the recipients of derogatory remarks about their fellow practitioners, are really quite a goodly part of the social side of medical history in all towns and villages; and were there a Valhalla for blasted reputations as effected by physicians, who under cover of smugness and extreme cordiality, are always busy feeding the flames of calumny, its dimensions could hardly be decided by any architect unfamiliar with the pettiness of medical human nature. But be this as it may—and our lackadaisical attitude is quite inured to this special medical weakness—an altogether different phase is put on the art of gossip when it is the betrayal of a trust, a holy one, that a patient places in the sanctuary of a friendly physician. Here again the simplicity of the manner, in which the outside world raises a sweet morsel out of a repository that was supposed to be tight-clasped, is smoothly effected, by the physician himself indulging in medical persiflage which means entertainment for his friends, but nevertheless has the insidious quality that no violence of language possesses.

The questions which often arise in the thinking mind are, Why do physicians, more than other men, persist in talking "shop," and, Does the study of medicine actually do away with interests which might be called world interests, since they have the largeness that appeals to all? These questions are not easy to answer, since they have an insoluble element due to the fact that in the medical world there is no oneness of thought as to what constitute dignity and self-respect, some medical critics going so far as to assert that directly physicians allow themselves to be drawn into the frivolities of conversation, there must undoubtedly be a lessening of that fine veneer without which the art of medicine is not properly upheld by its disciples. Of course, if this opinion prevails in a community, conversation is sadly hampered, and what more natural than that the physi-

cian should resort to that bulwark from which he has reluctantly separated himself—the doings in his medical “shop.” And then there is brought about a state of affairs that makes for just the gossip that should not obtain: small talk that is tinctured with enough pseudo-science to arouse the sort of curiosity in the breast of the layman that must be fed by a further chronicling of small medical beer. This may be a view with which few will agree; but were our opponents in criticism to delve deeply into the subject, they would glean at least a partial understanding of the fact, that the medical mind is warped, not so much by its studies, as by the iron-clad custom that it is unbecoming a physician to indulge in any conversation that might, for too long a time, make his friends forgetful of the seriousness and medical aspect of his calling.

AN ENGAGING CHAPTER IN OPTIMISM.

One of the interesting things in our social life, which should engage the attention of modern psychologists, is that when public opinion is wrought up over an occurrence that is disturbing enough to upset the even tenor of our lives for a short space of time—in fact change our customary optimism into a nine days’ pessimism, a self-appointed prophet invariably arises among us to cast the word abroad that our fears are childish and quite groundless, and that ignorance of the real conditions is the prime factor that must be held accountable for the peculiar workings of our minds. The prophet, who at this time has come forth to relieve us of some of the mental distress brought on by the reading of numerous poison cases, is far removed from this country, and therefore could not have had any special American case in mind when he wrote his essay; but the opportuneness of his literary offering is corroborative enough of what we have just written, in so far as its purpose is to allay our perturbations by a genial philosophy which perforce drives us to the conclusion that we have allowed our imaginative flights too much leeway. Dr. S. Squire Sprigge is a man of varied knowledge and hitherto has been continent in all his printed articles, but when he allows his invincible optimism to carry him to such lengths as evidenced in his paper “Some Comfortable Words About Poisoning,”* he lays himself open to the charge that his own good nature and his implicit faith in the goodness of man have made him so great an extremist, that he is capable of seeing only the obverse of a picture which surely has its reverse side.

**The Practitioner*, December, 1909.

While it is true, as we all know, that our days are not the days of Cæsar Borgia and the Marquise de Brinvilliers, that we no longer seize possets on their way to kings and commoners to distil poisons in the cups, that our knowledge of lethal doses is not the fine art it was in the Middle Ages, we cannot deny that medical science has placed, in the hands of those who are willing to be its ignoble hand-maids, a stealthy weapon whose machinations are far from easy to detect. We are not speaking now of strychnine or any other drug that has done yeoman's service in many chapters of real life and fiction, but of something that is more subtle and known only to the student in the laboratory—namely, the possibilities of cloaking one's bacteriological knowledge so cleverly that it may be the undetected means to a much-desired end. And here Dr. Sprigge waxes eloquent, for with a dash and swing that can come only from the unrestraints of excessive optimism he writes: "A terrific suggestion has been made by more than one writer that the results of bacteriological research might furnish the medical poisoner with the means to afflict his fellow-creatures with mortal illnesses, but the fears expressed have generally carried their own refutation, while they have been inspired obviously by a more than usual capacity for swallowing marvellous stories." Could a redundancy of words go further to prove the ineffectuality of quantity, and how important it is to ally oneself with the truth by means of a simple statement, even though this might be a reflection on our laboratory men? A bombastic phrase rushed into print always requires the pruning-shears of an editorial discretion, but when it is written with the obvious purpose of just writing so many words that mean nothing, its decapitation should not be delayed.

When we made the statement that the truth might be a reflection on our laboratory men we meant that they were really the ones in the medical profession, who knew, beyond a doubt, that the typhoid bacillus and the tetanus bacillus could be enlisted into such service as a furtive destroyer of life would desire. Even though Dr. Sprigge is quite positive in his asseveration, the ordinary facts of the laboratory are equally positive; and though we would rather it were as the English optimist would have us to believe, there can be no gainsaying of what is an open page to all medical men. Were we writing for the lay press our words would be more circumspect, since it is always well to be cautious when the public is the audience, but even then we would not be so strongly on the side of unveracity as was Dr. Sprigge when he published his article in the *Practitioner*.

OPINION AND CRITICISM.

TRADITIONAL differences between the science and the practice of medicine have existed for so long a time that at present medical men are divided into two great groups. On the one hand, there is the young physician who, on graduation, enters the laboratory and engages in "scientific medicine"; on the other, his colleague who devotes two years to a hard internship, and then becomes the "practical man." Each looks a bit askance at the foolish choice of the other; each thinks the other's course leads far from his own. Perhaps this is an exaggerated view of the exact state of affairs existing to-day, since the tendency of medicine is toward abolishing a divorce that is fundamentally erroneous in conception and detrimental to the progress of a real medical science. But that the separation exists can be denied by no one who attends medical meetings or who reads medical literature.

A brief retrospect will explain the real cause of the present situation. Its existence to-day is due to the natural tendency of the human mind to preserve a conventional mental habit, even when the source from which this habit arose is no longer known. Now, though the first important scientific contributions to medicine and surgery were made by practitioners, the development of the dependence of medicine on her sister sciences soon made necessary a special class of workers: men willing to sacrifice to the matter of work involved in the solution of new problems more time and attention than could be spared from the demands of a busy practice. Special laboratories sprang up everywhere, and medicine gave indications of becoming a true science. No doubt, at first, the laboratory problem may have seemed far removed from the requirements of the bedside; soon, however, the enormous debt of practical medicine to chemistry and physics, to pathology and bacteriology was recognized. The result of this amalgamation was that Lister and aseptic surgery followed Pasteur, and rational therapeutics supplanted empiricism because of the lessons learned from the physiological and chemical studies of the functions of the body organs. What was special knowledge a decade or so ago became part of the curriculum of every medical student so that to-day the basic principle of the study of medicine is scientific method. Yet to-day the words "science" and "practice" are used as the opposite ends of a diameter; the first connoting laboratory work; the second clinical work, as if science *per se* could not be practical, or practice scientific. The best results in medicine will always come from those who employ care in observation, logic in deduction, and a guarded imagination in seeking the truth. These qualities, which form the basis of any

science, apply as well to those medical men working in the allied branches of medicine far removed from the patient, as to those whose total efforts are at the bedside. At present medicine is in an evolutionary period: the coterie of workers, devoting time to the solution of problems and directly connected with the patient being on the increase, with a corresponding elucidation of many vexed questions of diagnosis and treatment. To the end of the complete development of this scientific interdependence, the union of the laboratory men and the clinicians on the common field of scientific method is necessary.

CARREL'S work on experimental surgery has often been called "The Romance of Surgery," and the latest chapter added through the efficiency of the simple method of lung ventilation, described by Meltzer and Auer, reads as interestingly as a tale by Robert Louis Stevenson. Carrel recently demonstrated before the Society for Experimental Biology and Medicine, in New York, the results of a "few *simple* operations such as the resection of a pulmonary lobe * * * * the dissection of the mediastinum by opening the two pleuræ and the pericardium and resection of a small part of the superior vena cava and its replacement by a piece of jugular vein." Incision and suturing of the aorta, resection of a piece of aorta and interposing a piece of cold storage jugular vein were so successfully performed on dogs that Carrel believes operations with the Meltzer apparatus will be as simple as abdominal section. The Meltzer method requires no expensive apparatus and no great technical skill. After preliminary deep anesthesia a catheter is put into the trachea to the right bronchus. Through this tube, by means of an ordinary foot-bellows, a current of air, or of air and ether, is passed at a pressure of about 15 mm. mercury, and the same pressure forces the used air out through the space between tube and trachea.

No parietic expansion of vision is necessary to picture the complicated relations of medicine and surgery when Carrel's work will have been transferred to the human subject. Just as perityphlitis, "inflammation of the bowel" and brain tumors have been removed from the deplorable inactivity of the physician to the arena of the surgeon, so localized pulmonary tuberculosis, mediastinal neoplasm, or aneurysm of the aorta may ultimately become the logical objects of attack by careful and courageous surgeons. Previous work on blood vessels and cardiac lesions has given strong support to the forecast of Sir Lauder Brunton that certain valvular diseases of the heart would ultimately become surgical diseases. Hence, are we wrong in saying that a much blurred view is ours when attempts are made to look too far into the maze of future surgical possibilities?

LITERARY NOTES.

It is not often that one can say that every page of a book is not only worthy of careful perusal but merits re-reading. This praise we willingly grant Dr. James Peter Warbasse, for in his "Medical Sociology," recently published by D. Appleton and Co., there is not a page that has not the author's imprint of an individuality that breathes of earnestness. Books that have for their object the enlistment of attention from physicians and laymen in equal proportions, often fail in their purpose, since they are either too technical or too mediocre; a recurrent mistake in a certain phase of the literature of to-day that has often moved us to acrimony. But no one who can write as intelligently as Dr. Warbasse, on such subjects as the need of a governmental department of health, the spread of tuberculosis, the typhoid-fever problem, and sexual hygiene, need fear that the dignity and common sense of his words will be lost on our communities even though the communal obtuseness is at present somewhat discouraging to contemplate. Lessons that are driven home without unnecessary circumlocution must needs be effective; this has been the history of all instruction that has had simplicity and directness; therefore, in this instance, we cannot but feel that great good will result, even though at first there may be some sensitiveness, followed by stubbornness, with those in authority on account of a criticism that is most trenchant.

THE lesson to be gathered from Dr. Charles Edward Woodruff's book "Expansion of Races," is that those who have been high in governmental affairs have failed all along to consider deeply the matter of the impossibility of acclimatizing colonists to conditions foreign to their customary *milieu*. This contention is not a mere statement founded on a limited number of observations, but the outcome of serious thought and substantial data. Moreover, it is presented in such an unbiased and thoroughly sane way that the intelligent reader cannot but be won over by the truthfulness and integrity of the author's arguments. A book that would have only one chapter of the importance of "The Myth of Acclimatization" would be one to point to for its outstanding qualities; but in the work under consideration there are many other salient chapters, such as "Tropical Neurasthenia," "Nitrogen Starvation or the Modern Famine," "Civilization's Dependence Upon Commerce," which must make a strong appeal alike to the physician and statesman. In short, Dr. Woodruff has given us a work of moment; and whether our preconceptions are too great to be thoroughly routed by all his arguments—and what reader does not approach a book with some ideas which cannot be squelched?—we must admit in all fairness that his book will give us food for thought. Just because colonization has from time immemorial been the pet scheme of all governments, does not mean that it is unim-

peachable; and even though, as in this instance, the attack on its harmfulness and futility is made by a mere medical philosopher, the pause that is given us is worthy of extensive consideration.

DR. JOSEPH GRASSET, who is already known to many students of psychiatry, on account of his much-discussed book "*Les Demifous et les Demiresponsables*," has just published through the well-known Paris publishers, Masson et cie., the second edition of "*L'Occultisme*," corrected and enlarged, with a preface by Emile Faguet of the French Academy. This book cannot be without interest to many, since to-day a lively discussion obtains in the scientific world in regard to the marvels of occult phenomena. In so many divers ways has the subject been threshed, that already the rather unedifying picture is unrolled before us of two decidedly opposing camps: those who are over-confident, and those who are so disdainful in their attitude that they will admit nothing. Dr. Grasset, in his book, is a sort of philosophic peacemaker, for, with a judgment that is almost faultless, he takes up each thread of the abstruse subject in such a way that no inferences, but the right ones, can be drawn either by the enthusiasts or the recalcitrants. In separating theories from facts, he shows that the theories are too premature for immediate acceptance and refutes in no disguised terms, spiritism, the evocation of spirits, all psychic radiations, phantoms, astral bodies, biometry. As regards the facts, the author shows that though the occult phenomena are as yet not scientific, as this term is understood to-day, they may become so, for they constitute what he is pleased to call, the Pre-scientific Marvels. Therefore, occultism may be considered the Promised Land of science. In fact—so runs the author's thought—many of the phenomena which were considered occult some years ago are to-day no longer placed in that category. Among the facts which have lost their mysterious envelope of occultism and have passed into the province of science are—and again we are voicing Dr. Grasset's opinion—animal magnetism and hypnotism, involuntary movements when in a state of unconsciousness (moving tables, Cumberlandism with contact), inferior sensations and inferior memory (false divinations, cristallomancy, the reminiscences and false judgments of inferior psychism), and, finally, the association of ideas with the inferior imagination (trances and marvels of mediums).

As for those facts which have remained occult up to the present, because they have not been experimentally demonstrated, but which may some day be matter for inquiry, the author divides them into two groups: the first consisting of telepathy and premonitions at great distances, and materializations of phantoms, for which the only explanation appears to be very far off; the second, of mental suggestion and direct communication with thought, nearby displacements without contact (levitation and rapping), and clairvoyance, all of which should be made the subject of inquiry at once, for the demonstration of these is closer at hand.

ORIGINAL ARTICLES.

A PLEA FOR UNIFORM INTERSTATE RULES IN THE TREATMENT OF THE VENEREAL DISEASES AS A PROPHYLAXIS OF THE EVIL OF SOCIETY.

By A. RAVOGLI, M. D., of Cincinnati, Ohio.

The individual, male or female, who is suffering with any one of the venereal diseases, tries to conceal his or her trouble as long as possible, to follow his or her ordinary occupations. When they can no longer stand on their feet they are compelled to seek medical attendance. While concealing the disease the venereal patient is a focus of infection, and, therefore, dangerous to others as a source of the contagion. Venereal diseases are concealed and it is the duty of the physician, of the legislator, of the municipal authorities, to find them out in order to remove the focus of infection. If we have been, and if we are, so strenuously advocating of the surveillance of prostitution, it is not because we intend that the government, or the State, shall have to guarantee the good quality of the merchandise, but only because we wish the focus of infection found and any danger of infection removed. In a few statistics taken from our City hospital, to which we have referred in a book on syphilis, we showed that many sporting women, when infected and unable to receive visitors in a house of prostitution, begin to look for a position in a family as servant girls. We should like to ask any one of those extremely religious people who find so horrible and so debasing the sanitary inspection of the prostitutes, if they could safely have a girl affected with a venereal disease attend to their children.

If we consider each one of these diseases, for instance gonorrhea, how easy we find infection to be. Illicit contact is not always necessary. Often do we see gonorrheal ophthalmia in children, and find very difficult the explanation of how infection could occur. We see little girls affected with gonorrheal vulvitis and vaginitis, against whom never have been perpetrated any criminal act, and so we find it extremely difficult to explain the origin of the infection. The infection with syphilitic virus is also a very easy matter. We are still giving treatment to a child who was infected, when one year old, through a toy, the so-called jewish harp. The family had in their employ a young man who, infected with syphilis, had an eruption of mucous patches on the lips. The babe was rolling about on the floor trying to play the harp; the boy was

playing with the babe and was showing the babe how to obtain the sound from the instrument. The babe was imitating the boy and in so doing put in its mouth the harp soiled with syphilitic mucus and saliva. The babe three weeks later showed a hard chancre on the upper lip, and the entire syphilitic symptoms developed.

When we have so clear and so conspicuous examples of infections outside of illicit intercourse, why hesitate to make the strictest rules to prevent the spreading of so horrible a contagion? The treatment of the infected diminishes the possibility of the contagion. Indeed when we cure the early syphilitic lesions, which are the carriers of the virus, we will diminish the spreading of the disease. To Alfred Fournier* is due the establishment of the important prophylactic rule, which is now in the hands of the physician, and has given good results. A well directed treatment has to be considered the best prophylactic means for checking the contagion of venereal diseases. In the treatment we have a double object, one to free the patient from his sufferings, the other to check the spreading of the infection. Infection is spread only by infected people who are trying to conceal their ailments, who do not realize the gravity of the disease, and the consequences to which they are subject. They do not calculate the extent of the damage they are causing to the other party, who in a great many instances is innocently infected and will suffer tortures through life. Two thirds of all uterine diseases in married women are the results of gonorrheal infection which they have received from their husbands at the time of their marriage. The incompletely cured gonorrhea, that little gleet discharge, which commonly is considered to amount to nothing, is the carrier of infection to the genital organs of the female. Most of the so-called born blind, are blind on account of the gonorrheal ophthalmia. The fetus on passing through an infected vagina, has the gonorrheal secretion forced into its eyes, and this produces that dreadful specific inflammation, which destroys the transparency of the cornea. It is worse still in the case of syphilis! It is easily communicated through any superficial lesion directly to the wife through any contact. Supposing that it is at a latent stage it is transmitted to the offspring in utero, and from it by the placental circulation to the mother. Syphilis does not spare any organ, any tissue of the organism, skin, bones, nervous system, hair, nails are equally affected.

Before such a dreadful peril and sad consequences from the venereal diseases all timidity and foolish secrecy must cease, and the necessity of stamping them out must be realized. If the treatment has been recognized as an effective way to check the spreading of infection, this treatment must be advocated and made of easy access especially for the poorer classes. These patients should have easy access to hospitals and clinics. The hospitals in the great majority of cases are closed to the venereal patients. If a venereal patient is admitted it is through a mistake of the

*Fournier, A. La Prophylaxis de la Syphilis par son Traitment. Bulletin de l'Academ. 1899.

receiving physician. Often a patient with gonorrheal arthritis is admitted in the medical service for rheumatism. Cases of syphilis of the liver have been admitted for chronic interstitial hepatitis, syphilitic ulcerated gummata for chronic ulcers of the leg. But when a poor patient suffering the tortures of gonorrheal epididymitis, with suppurating bubo, or ulcerated mucous patches of the mouth asks for admission to the hospital he is refused. The reason is that the disease is the result of his or her own indiscretion. This seems a procedure worthy of the Middle Ages! Probably it is worse! At that time the patients were admitted for treatment in the hospital, and when discharged they were soundly whipped as a punishment for having contracted the disease. Some hospitals especially municipal hospitals accept venereal patients, but as soon as the patient is somewhat better and is able to go about he is discharged or he asks to be dismissed. He leaves the hospital with an active subacute gonorrheal urethritis, or with some mucous patches of the lips, or tongue, etc. On the other hand in the case of a chronic disease like gonorrhea, or like syphilis, which it takes years to cure, nobody can presume that a patient must remain for such a length of time in the institution. For this reason we find the hospital recommended only in those cases in which the patient is disabled by severe symptoms and when it is necessary for him to remain in bed, have careful diet, and special nursing. But when the patient can get about, can do any work, attend to his occupations, all that he needs is medical advice, external and internal medicines, and for this the clinics and public dispensaries are the places best adapted for the treatment.

The quality, the locality, and the ways of conducting these clinics is a matter of greatest interest, and plays a great role in the efficiency of the work. Fournier described the clinic for the skin diseases and syphilis attached to the Hospital St. Louis in Paris. A large gloomy hall is used for this purpose: in front there is a long table, where the chief of the clinic sits with all the assistant physicians; behind it, are the surrounding benches which are constantly filled with students, physicians and visitors. This is sufficient to create a depressing impression in the poor patient. Moreover on account of the large number of patients they must sometimes wait two or three hours before being admitted. The largest number of these patients comes from the class of the working men, and a long wait means half a day or one day lost. The patient is compelled to disrobe and half naked make his appearance before the public. When a patient is affected with syphilis he must confess his guilt before forty or fifty people.

The physician in charge, after having seen many patients, is tired out, wishes to be through with his work, and usually limits himself to giving a prescription, and telling the patient to come back in a week.

This system of clinics has been condemned by Fournier as injurious and dangerous. In many instances the patient has been but once to the clinic, has heard his sentence in the diagnosis, has received his prescrip-

tion, has taken the pills prescribed for several weeks, has been somewhat benefited. He however has remained so badly impressed, that he has no more courage to go back to that gloomy room, and lose half a day's or a whole one's wages. In such a condition this man remains a source of contagion and will spread syphilis or gonorrhea without care. Not infrequently has it happened that his intended bride has been infected with chancre on her lip through a kiss. When the man was questioned by Fournier how he could kiss his sweetheart when he had this inoculable disease, for which he had been to the clinics for treatment, he replied that no body had ever told him that the disease was contagious through kissing. In another case the man had inoculated his wife at the time of their marriage, both were syphilitic, brought to Fournier a miserable looking creature, their offspring contaminated with congenital syphilis. When the father was asked how he had the courage to get married while having that disease, the reply was that neither in the clinics nor in the hospitals had anybody ever told him he could not marry.

In another case a syphilitic child born of syphilitic parents was given to nurse to a healthy woman. The nurse got a hard chancre of the nipple, from suckling the babe. When the father was reproached for his carelessness, he said that nobody had told him anything in reference to the danger of infection.

These few examples show that it is the duty of the physician to instruct the syphilitic patient concerning the danger of communicating the disease to others. It is necessary to call his attention to the different ways of transmission of the disease outside of sexual intercourse; as through utensils, pipes, towels, etc. In some clinics short printed instructions are given to each patient referring to his disease, and to the ways to avoid infection. We think it, however, much better to give instructions to the patient verbally, than to give a printed sheet which in the most of the cases the patient does not read, and soon destroys for fear of being found possessor of some printed matter from the clinic for venereal diseases.

In order that the work in the clinics and dispensaries may produce good results, it is necessary that these institutions be small, and the work as private as possible. With a limited number of patients the physician can give a few minutes to explain the dangers of contagion. The beneficial effects of the treatment as a prophylactic means of diminishing the spreading of the venereal diseases has been well understood by the Italian government, which in the Section III. of the Sanitary laws has given out interesting dispositions concerning the prophylaxis of these diseases. It is interesting to study this piece of legislation and to see that in many particulars it could be adopted as an Interstate rule in our country. The following are considered venereal diseases: Gonorrhea, chancroid (soft chancre), syphilitic infection.

Physicians are compelled to report to the health officer any case of syphilis transmitted by a wet nurse, or by the suckling child to the wet nurse.

For the public prophylaxis against venereal diseases there is provided: 1. Free medical assistance for the poor and free distribution of medicines. 2. Institution of dispensaries in any locality where the need is found. 3. Treatment for all persons affected with contagious manifestations, in the clinics and in the hospitals.

The free treatment of the venereal diseases is a part of the free medical assistance of the free dispensaries of medicines whether in institutions kept up by communities or by charity, just as it is their duty for all other diseases. To such an extent is this true that all communities small or large are compelled by the government to provide free attendance for the poor and for the infected with venereal diseases in the same way that they do for any other disease. Absolutely no discrimination can be made in the matter of venereal diseases.

The physicians of those hospitals, which, according to old rules have refused treatment to venereal patients, if engaged in outside practice cannot refuse treatment to such patients.

In the cities having a population above 40,000 the community has to institute dispensaries for the purpose of the treatment of those diseases. The number of dispensaries shall be established by mutual consent between the municipality and the department of the interior, or by the latter alone; in this case by advice of the board of health of the county or by the board of health of the State.

The said department shall provide for the necessary expenses from the annual budget from special funds established by the department according to the financial condition of that community and to the prevalence of the venereal diseases.

All of the expenses are to be assumed by the community and the Department of the Interior. In case of disagreement as to the division of expenses the sum shall be determined by the Department under the advice of the board of health.

Even the communities with less than 40,000 inhabitants may institute dispensaries for venereal diseases, and get expenses paid in part by the Department of the Interior.

In some communities the institution of dispensaries for venereal diseases may be made compulsory on account of a remarkable increase of the venereal diseases. The decree for the compulsory institution of dispensaries may be made through the city council, the county board of health and the superior board of health of the State. In the cities where there are clinics for the treatment of venereal diseases the dispensaries may be attached to these institutions with an annual contribution to be paid by the Department of the Interior.

The physicians for these dispensaries shall be selected by examination according to the rules already established by the Department. They shall give their services to every patient, who comes to the dispensary. The treatment must be given free of charge without any distinction.

Patients with venereal diseases, males and females, have to be admitted

in all hospitals general and communal, or in any charity hospital. The expenses for these patients will be paid by the State, with the single exception of those institutions purposely established for the venereal diseases; in this case the expenses will be according to the established rules.

In the institution of wards for venereal diseases special agreement will be made between the department and the hospital authorities. The hospitals, when required to establish wards for the treatment of venereal diseases, cannot refuse to arrange a section for this service, exception being made for hospitals established for the treatment of other special diseases or religious institutions where by their statutory rules the treatment of syphilis is excepted.

Physicians practicing in the locality cannot refuse a certificate for admittance to the hospital nor the officer of the community to certify to the signature, to a poor person affected with venereal diseases with contagious manifestations.

Dispensaries must, if possible be connected with hospitals, or situated in localities not much frequented. They must have a waiting room, and a treatment room. In the last the patients must be admitted one at a time. The dispensary must have its rules establishing the duties of the personnel, the hours for treatment, and all that is necessary for obtaining good service. It has to be opened every day at different hours for men and women. Each dispensary must have two nurses and all that is necessary for examination, dressing and disinfecting.

The medicines and the material for dressing shall be supplied by a drug store, which shall have a contract with the community.

The physician of the dispensary must keep the records of the patients for clinical and for statistical purposes. Each patient has to be registered, giving name, age, occupation, address, the diagnosis of the ailment, anamnestic data, observations of some interest, treatment and result.

These records must be kept by the director of the dispensary and are to be shown only to a competent authority.

The directors of the dispensaries for venereal diseases have the duty of furnishing the health officer, and the health department, either municipal or the State, with statistics and data as they may be required.

Prescriptions which are given in the dispensaries for venereal diseases must have no official heading, which may be shown the quality of the institution, nor the name of the patient, diagnosis, etc. They shall have only the signature of the physician like that of any attending physician. For patients entirely unable to pay who must be furnished with medicines, the prescription will have the name of the patient, but no indication of the quality of the disease. When the remedies are supplied by some charitable institution, the prescription will be written on their own blanks such as are used for all other patients without any indication of the diagnosis.

Dispensaries and hospitals for venereal diseases are under the immediate surveillance of the health department of the counties. The

wards for the treatment of venereal diseases in the hospitals are established by the Department of the Interior and the different districts from which the patients are admitted.

In the wards the public prostitutes have to be separated from the other women, who, although suffering from venereal affections are not such.

Female patients, when admitted in the venereal wards, must never have on the clinical history their family name. The directors of hospitals or clinics have to avoid in the service anything which may hurt personal feelings.

In case of necessity a patient suffering with venereal diseases, can be admitted by the health officer into any hospital although against their rules. This disposition especially concerns children.

Physicians are compelled to report to the health department any case of syphilis transmitted by wet nursing. In this case the health officer must have the nurse treated in a ward of a hospital, or if the nurse has means she can be treated in her own home, but the physician must take on himself the full responsibility with a written declaration.

The child shall be fed artificially and care must be taken that it does not become a focus of infection. In urgent cases nurse and child shall be transferred to a hospital for treatment.

Without doubt these rules ought to be accepted and enforced in every civilized country. Whispering about this scourge of society has no good effect in diminishing its terrible inroads in the individuals, in the family and in society. It is necessary to act and see that those who are suffering are cured, and that the infection is not spread. Every city hospital must have venereal wards, and even other hospitals in urgent cases must not refuse admittance to venereal patients. A man who is suffering has to be relieved no matter for what reason he may be suffering, since in many cases it may be entirely without his fault. It is a relic of the barbarism of the Middle Ages that the rules of many hospitals in our country should refuse admittance to venereal patients. It ought to be made entirely imperative that every hospital have a department for the venereal diseases, or, if not, it must provide accommodation for urgent cases. Physicians having charge of this special department must have had a special training in the treatment of venereal diseases. We will never succeed in eradicating this evil of society so long as the physician will assure a syphilitic patient that after two years, he will be perfectly cured and will be allowed to marry without any fear of infecting his wife and his family. The same thing happens in the case of gonorrhea since physicians have declared patients affected with chronic posterior urethritis as cured for the simple reason that the discharge had stopped. For this reason it is of great interest to give thorough instructions to the physicians in the matter of venereal affections, and especially to those who have to take charge of venereal wards in the hospitals in clinics or dispensaries.

The clinics and the dispensaries are of great benefit and will aid in the

treatment more than the hospitals. We have already remarked that gonorrhea, and syphilitic infection are diseases of long duration, and that a man or a woman cannot be detained in the hospital for too long a time. In clinics and dispensaries they receive advice, medicines, and necessary treatment while pursuing their ordinary occupations without any undue trouble. Clinics and dispensaries must be of easy access, and it has been found much better to have the clinic or dispensary for the treatment of skin and venereal diseases combined. In this way the patient does not have to be afraid of being seen, as he may be coming to be treated for a disease of the skin.

We must state that the most important means for preventing the diffusion of venereal diseases is greatly in the hands of the physician by instituting a good and rational treatment, and by cautioning the patient as to the danger of spreading the contagion. In consequence clinics, dispensaries, dermatological institutions for the study and for the cure of venereal diseases are of the greatest interest for individual and public prophylaxis.

The young physicians have now in every medical institute courses of lectures and clinical demonstrations on the subject of venereal diseases. They have to pass the examinations in dermatology and syphilology in the colleges before obtaining their diploma, and then again before the state boards before obtaining the license to practice.

The advertising quacks have selected this field of medical practice, and with their false promises and bombastic assertions in the daily newspapers are misleading the patients, with bad results for them and for public welfare. They promise sure cure, and the patient, in the belief of being cured, remains a focus of infection dangerous to others.

As we have established that the treatment of the venereal diseases is the best prophylaxis against the spreading of the scourge, it is clear that some interstate rules concerning this treatment would be of great advantage to combat their diffusion.

These rules could be formulated as follows:

1st. Every hospital (unless it be for special diseases) is compelled to accept venereal patients when disabled.

2d. In every general hospital there must be a department for the treatment of venereal diseases.

3d. In these wards there must be observed complete secrecy and discretion, in order to prevent any publicity.

4th. It must be in the power of the health officer to compel any hospital to give treatment to a disabled venereal patient.

5th. In large cities the patients must have the benefit of the clinics and dispensaries attached to the hospitals or to the medical colleges.

6th. In smaller communities dispensaries must be instituted for treatment of venereal diseases, by order of the county board of health.

7th. Medicines and treatment for poor patients must be given free of charge.

8th. Physicians in charge of these dispensaries must be specialists well trained in the treatment of these diseases.

THE SYMPTOMS OF UNCINARIASIS.*

By GEORGE DOCK, M. D., of New Orleans, Louisiana.

Although the topic assigned to me is the symptomatology of hookworm infection, I feel that at the risk of repeating what others will say, and say better, and at the certain risk of perpetrating a bull, I must allude to cases of hookworm invasion without symptoms. Notwithstanding all that we have learned about latent infection, of immunity, of bacillus carriers, and of the numerous contradictions between the anatomic or chemical abnormalities in the body and the reactions to them, it is a peculiarity of the human mind that it finds difficulty in realizing that there are in all infections great variations in the number, intensity and interweaving of symptoms, and also that in most, if not all infections and invasions, it is possible to find entire absence of symptoms. The most striking examples are seen in typhoid bacillus infection, in which virulent germs may keep growing in the body for fifty years or more, but hookworm is almost as remarkable.

From the standpoint of the symptomatologist, these are only interesting facts, but from the standpoint of the hygienist, the economist and statesman, or the well-rounded student of pathology, they are of enormous importance. For, obviously, the people who harbor such parasites may be much more dangerous to the community than those with severe symptoms, who are early recognized and treated, or who soon die.

Instead of saying we can have hookworm without hookworm disease, we should say that hookworm disease has at least one symptom, the presence of eggs in the feces.

The hosts may with advantage be considered as having one symptom, the presence of eggs, as shown by microscopic examination, and may be placed at one end of a series. The other extreme is represented by peracute cases, and between the two extremes we find all degrees of severity of the most usual symptoms and bizarre combinations such as may be mistaken on superficial examination, just as may the mildest forms, for quite different diseases.

The proportion of latent cases or carriers in a given population cannot be stated without actual examinations. No doubt it varies according to several factors, especially number of worms, original strength of constitution, formation of immunity and quantity and quality of food eaten. Among many African negroes, American negroes, Asiatics and Filipinos, the proportion is high, from 50 to 75 or even more than ninety per cent.

*Read before the Southern Health Conference, Atlanta, Georgia, January 19, 1910.

Many writers on hookworm in America emphasize the large proportion of cases of hookworm with few or no symptoms. This was true of practically all the sixty recruits found to harbor hookworm out of 100 examined by Chamberlain.

Recently, at my suggestion, Dr. Bass and Dr. Gage have examined the stools of medical students from various parts of the South. They find as many as thirty per cent. infected in one class.

Among these men, as among the recruits examined by Chamberlain, good digestion and full feeding doubtless had much to do with the relatively good condition of the hosts.

It is interesting to note the number of worms in some of these cases. The average number in Chamberlain's cases was sixteen, ranging from one to ninety-nine. Dr. Bass in one case found 200. Even the smaller figure, sixteen, shows that the carrier could be a danger to those running risk of infection, if he followed the habits of the country in any place where soil and climate favor the life of the carrier, that is, in most inhabited regions of the Southern states.

It may be assumed, then, that among healthy-looking people in hookworm countries, from one-quarter to one-half have hookworm, and the only symptom is the presence of the eggs in the stool.

The chief factors that tend to cause uncinariasis, that is, disease phenomena due to hookworm, other than absence of immunity, of which we know but little, are early age and poor diet. The disease is most destructive in the young, the greatest amount of sickness and death occurring between ten and thirty years of age. Foods, bulky and irritating diet, which tend to cause indigestion and catarrhal conditions of the stomach and bowels, are especially likely to favor the development of symptoms, no doubt by lowering the factor of safety or the physiologic margin, and starting a vicious circle.

When the number of worms and the body of the host are such as to cause symptoms, these vary, as has been said, in intensity. Three degrees have been described by many writers, mild, moderate and severe, and such a classification has some advantages if we clearly realize that there are innumerable transition stages, so that the divisions are arbitrary and only useful as guides.

Mild Cases. Mild cases pass imperceptibly out from the latent cases, but when recognizable show a sallow skin, variation in appetite, digestion and action of the bowels; sometimes pain in the abdomen. The muscles are soft and flabby, fatigue is easily brought on, so that "laziness" is often present and mental indolence is likely to be associated with it. In other words, malnutrition, such as can be caused by any mild infection or from insufficient or poor food, or gastrointestinal disturbance. In more distinct cases there is pallor, with hemoglobin sometimes lower than would be suspected from the color of the skin, *i. e.*, to sixty per cent.; palpitation of the heart, dyspnea on exertion, dizziness, and tinnitus, are often associated. The cachectic appearance is likely to be attributed

to the dyspepsia or the quality of food eaten, or sometimes to malaria, which may even be associated, or amebic dysentery, but the diagnosis can readily be made by examining the feces for ova as should be done in all people who may possibly harbor the worms and the diagnosis of malaria can be made by examination of the blood.

In the moderate cases pallor and dyspeptic symptoms are more distinct and often dominate the picture. Perversions of appetite occur, but are often concealed by the patient, so that the symptoms may not at once be striking. Nausea is frequent; vomiting may occur. Tenderness in the epigastrium or lower down in the abdomen, with a feeling of weight, is common. Dyspnea and palpitation of the heart are frequently present. There is often slight dilatation of the heart; accidental murmurs over the base and the great vessels, and a frequent and weak pulse, with more or less dropsy. Muscular weakness is sometimes pronounced. Dizziness, tinnitus, headache and physical and mental torpor are frequently very marked. Paresthesia, pains in the joints and absent knee jerks often occur in such cases.

In the severe cases the anemia, weakness and dyspepsia are more severe. Dropsy occurs in the subcutaneous tissue and abdomen and other serous cavities. The appetite may be completely lost, or may be voracious, with pica, leading to the eating of earth, dirt of all kinds, rags, hair, etc. The dyspnea and cardiovascular symptoms are intense, as are the loss of strength and apathy. Impotence in men and amenorrhea in women are almost invariable, yet the women may have children, who are either rachitic or show marked cachexia, and in time become subjects of severe uncinariasis.

In some cases the severe symptoms develop suddenly, either from complete health or from a milder form and quickly lead to death. In some tropical countries they are mistaken for beriberi; in our own not a few are mistaken for Bright's disease.

It may be well to speak of certain phenomena more at length.

Bodily Development. Severe uncinariasis in childhood causes a remarkable lack of development, so that a person of 20 to 25 may resemble in height, lack of body hair and of genital growth, and also in bony development as shown by rentgenographs, a child of 12 or 14. In these cases the face sometimes has a much older look and often a characteristic tired and anxious expression absent from some other trophic diseases with retarded development, like myxedema. Puberty is delayed and menstruation may not begin until 18 or 20, or not at all.

Skin. Too little attention is paid to the dermatitis that in many, if not most, cases ushers in the infection. While most patients give a history of "ground-itch," "dew itch," or the like, few such cases are seen by physicians. But all should be seen by physicians who should have in mind the possibility of hookworm and search for ova up to ten weeks from the beginning.

The color of the skin may vary from slight pallor to a dead white, or a deep sallow, or marked lemon color, as in pernicious anemia. Pallor

of the ears, nail beds, and mucous membranes vary in the different degrees. The scleræ are usually white or bluish white, and do not show, so far as I have seen, the fine, granular, yellow subconjunctival fat so characteristic of pernicious anemia of idiopathic form.

Emaciation is not always present, or it may be masked by edema.

Dirt Eating. This is a result of the disease and not the cause of uncinariasis, except in rare cases.

Mental and nervous symptoms are numerous and varied. Apathy, depression, somnolence, pain in the head, extremities and joints, and paresthesia usually occur in various combinations and intensity.

In rare cases marked psychic disturbances occur. Austregesilo and Gotuzzo report insanity with delusions of persecution, "Witzelsucht," loss of memory, etc., as well as change of character, appetite and taste. MacDonald has described marked moral perversion in children, in addition to perversion of appetite and cured by thymol treatment. Signorelli describes meningeal syndromes, epileptiform, convulsions and neuralgias. William Allan has called attention to the relation of hookworm to neurasthenia.

Among our own hookworm population I know of no psychologic tests, but it seems to me they would be of great interest. May it not be that some of the psychic manifestations of a part of the rural population, the "moonshining," "gun-toting," feud-maintaining and lynching tendencies, are assisted by the physical and mental malnutrition due to hookworm?

The abnormalities of the blood are striking and suggestive. The color of the skin and the general appearance of the patient suggest pernicious anemia, but the hemoglobin is almost always relatively low and the eosinophiles almost always high, in strong contrast to the former disease. Retinal hemorrhages occur in both diseases; night blindness seems comparatively frequent in hookworm anemia.

The cardio-vascular symptoms have given a name to the disease—Mal-de-Coeur. Dilatation, murmurs, palpitation, bounding vessels and dyspnea sometimes furnish striking symptoms. As in some other diseases, aneurysm may be suspected, or valvular disease, readily cured by proper treatment.

It is interesting to range through the symptoms of hookworm disease, to note the wide variety of the morbid phenomena, and the number of diseases or symptom pictures which it may resemble. It is also interesting and instructive to point out the differential diagnostic features of the various conditions. But in most cases so painstaking a method is not only unnecessary, but is a serious practical, as well as technical, mistake.

The direct method is the only rational one. The hookworm is the cause of the symptoms, directly or indirectly. It must be sought for by searching for its ova, which even in mild infections can be found by comparatively brief search. All other possible causes of disease, such as malarial parasites, amebæ and other intestinal parasites and organic diseases must be searched for by proper methods.

THE PATHOLOGY OF UNCINARIASIS.*

By NEWTON EVANS, M. D., of Nashville, Tennessee.Professor of Pathology, Medical Department, University of Nashville and
University of Tennessee.

In undertaking a study of the pathology of uncinariasis it becomes evident that there are certain rather decided differences between the findings in those cases of death from the *ankylostoma duodenale* and those from *uncinaria americana*, and for the most part the lesions in *ankylostomiasis* show the greater degree of severity.

It seems that in the comparatively few years that the disease has been recognized and studied in America the number of systematically conducted autopsies has been rather small, at least I have been so impressed in the examination of the literature accessible to me.

In addition to the post-mortem pathology we should with reason, I think, also consider the blood findings which must be ascertained during life; and the remarkable work of Loos, Bentley, and Claude Smith make it imperative to describe the cutaneous lesions of ground-itch as an essential part of hook-worm pathology.

Blood Changes. As in all the other phases of the disease we must distinguish carefully between the findings in the severe cases, which often result fatally, on the one hand; and the cases which are accompanied by only very mild symptoms and are difficult to recognize or have no symptoms at all, except the finding of eggs and worms in the feces and usually increased eosinophiles in the blood on the other hand.

As conclusively shown by Chamberlain in his investigation of Southern bred recruits of the United States army, a very large proportion of all the rural population in the Southern states must have hook-worm infection of greater or less severity at some period of their lives. Of 147 men, including both new recruits and those who had been in the army for several years, 64 showed ova of *uncinaria* in the feces. All of these were light, not one showing symptoms which could lead to the diagnosis except the presence of the parasite and the presence of eosinophilia in a large percentage of the cases.

Hemoglobin. In Chamberlain's¹ sixty-four cases, all light and without symptoms, the hemoglobin was from 80 to 100 per cent. with an average of 91.5 per cent.

Bass² reports the blood findings in sixty-two cases of mild infection. The hemoglobin percentage averaged 90. The red cell count averaged 5,125,000 in these cases.

*Read before the Southern Health Conference January 18-19, 1910.

In five cases of light infection which I have examined in children suffering with pellagra the hemoglobin averaged ninety-three per cent.

In severe cases. In Ashford's³ nineteen cases (Porto Rico) the Hemoglobin varied from ten per cent. to fifty-five per cent.

Leonard⁴ (Island of Grenada) twenty cases. (Both ankylostoma duodenale and uncinaria americana were present, the majority of cases showing the ankylostoma.) Hemoglobin varied from eight to forty per cent.

Colbert⁵ (Porto Rico) 5,000 cases. Average hemoglobin was 44.1 per cent.

Ashford and King⁶ (Porto Rico) 579 cases at random averaged 43.09 per cent., running as low as eight per cent.

Perry,¹⁴ Greensboro, Ala., 100 cases. hemoglobin varied from 10 to 90 per cent. Average 42 per cent.

Capps⁷ (one fatal case from Panama). Hemoglobin decreased from 18 per cent. to 11 per cent. at the time of death.

Harris,⁸ 1 case. Hemoglobin 20 per cent.

Red cell count is not given in any series of mild cases except in that of Bass,² in 62 cases. Average was 5,125,000.

In the severe cases there is a decided reduction of red cells.

Ashford,³ 19 cases. Varied between 697,766 and 3,524,000.

Capps,⁷ one case. Progressed from 2,500,000 down to 748,000.

Harris,⁸ one case, 1,760,000.

Hemoglobin index. In mild cases this is unimportant. In severe cases Ashford and King⁶ give an average index of .5. Ashford³ in three cases out of nineteen cases gives the hemoglobin index as high as one or above.

LEUCOCYTE COUNT. *Mild cases.* Chamberlain¹ in twelve cases in which the count was made, gives the white cells from 12,700 to 7,600—average 9,600.

Severe cases. Ashford, 19 cases, 1,500 to 18,000, average 7,800.

Leonard, 20 cases. No leucocytosis present.

Ashford and King average on admission 8,009.

Harris, one case, 4,020.

It is important to notice that in some of the most severe cases a decided leucopenia rather than leucocytosis is present.

Eosinophilia. In the differential count of white cells apparently the only important abnormality occurs in the number of eosinophiles. Eosinophilia is almost a constant finding.

Mild cases. Chamberlain, 64 cases, one per cent. to 20 per cent., average 8.5%. Only 22% of the infected cases had less than five per cent. Eleven per cent. of the non-infected persons had over five per cent. The average of 83 non-infected persons were 2.2%.

Bass, 152 cases; in 74 per cent. of cases there were less than four per cent. eosinophiles. In only six per cent. were there more than six per cent. eosinophiles.

The writer's five cases (pellagrins) gave from 9 to 14%, average 11.5

per cent. After one treatment with thymol, the counts varied from 14% to 34% with an average of 19%.

Severe Cases. Ashford, 19 cases. Varied from $1\frac{1}{4}\%$ to 40%. Average 9.8%.

Leonard,⁴ 20 cases. Average 18%. (The majority of Leonard's cases were said to be the ankylostoma instead of *uncinaria americana*.)

Capps, one case. Eosinophiles progressed from 13% to 7.6% as patient grew worse.

Harris, one case, 2%.

Practically all observers are agreed that the degree of eosinophilia is *not* an index of the severity or amount of infection. A careful analysis of the figures in the 64 mild cases reported by Chamberlain admirably demonstrates this point. The average number of eosinophiles in these cases was 8.5%. Classifying the cases upon the basis of the number of ova in the feces, we get the following: Twenty-three had "many" and "very many" eggs with an average eosinophilia of 8.1%. Twenty-one had "few" and "very few" with an average eosinophilia of 9%. Ranging the same cases according to the number of worms recovered after treatment, we get the following: Sixteen cases of the 64 had over 20 worms with average eosinophilia of 7%, while the average of the entire number was 8.5%.

Again, considering the severe cases, Ashford gives an average of 9.8% eosinophiles, and in 19 cases, 6 had four per cent. or less. Ashford and King concludes that eosinophilia is very liable to be absent in the more serious cases. They give their conclusions in the following words:

"Eosinophilia is the chief feature of importance. It is strange that Boycott and Haldane lay so much stress on the importance of eosinophilia from a diagnostic point of view, for in the more serious cases it is liable to be absent. In 1904 we called especial attention to our belief that eosinophilia was of great *prognostic* importance and have noticed that some German and Spanish writers have expressed the same view. Very chronic cases of severe type, poor resisting power, and lack of blood regeneration, rarely show eosinophilia or, if at all only to a slight degree. A rise in eosinophilia is of great prognostic significance and their fall, with lack of improvement in symptoms, is not a good omen. In general, good resistance to the hypothetical toxin of *uncinaria* is expressed by eosinophilia."

Alvarez⁹ in Mexico, where all the cases are said to be infections with the European variety, calls attention to the fact that there is usually a decided increase in eosinophilia shortly after successful treatment with anthelmintics. The leucocyte counts in my own cases show a decided increase in eosinophiles a few days after the administration of thymol.

Several writers emphasize the point of great resemblance between the blood findings in the severe types of uncinariasis and true primary pernicious anemia. In the case of Capps which resulted fatally, as the

severity of the symptoms increased, the blood showed at first typical secondary anemia which gradually changed to a picture closely resembling that of pernicious anemia. However, Ashford and King give the average hemoglobin index in the severe cases as only .5; but three out of nineteen of Ashford's blood counts gave an index of one or above.

Of other changes in the blood characteristic of severe anemia we may mention the presence of erythroblasts which, however, are usually rather scanty and this is especially true of the megaloblasts. In this respect the blood differs from the usual forms of primary anemia.

Poikilocytosis and polychromatophilia are present typically in the severe cases.

One of the most remarkable features of the hook-worm disease is the complete lack of agreement between the severity of symptoms and lesions including the blood changes, and the number of worms found in the intestines. This is shown most graphically by Sandwith's post-mortem findings (all in cases of ankylostomiasis) where in 26 fatal cases the maximum number of worms found in autopsy was 863. In 6 out of 18 of these fatal cases (all of which had received no treatment to dislodge the worm) there were less than ten worms in each case and in two cases there was only one worm in each. These facts lead to the almost inevitable conclusion that the cause of the anemia and its resultant symptoms is not the direct loss of blood, but is rather due to a toxemia caused by some poison generated by the parasite, to which the organism in the cases where the patients die with only a few worms present, must become unusually susceptible.

The observers who have seen large numbers of the severe cases and of those harboring great numbers of the parasite conclude that there is little relation between the number of worms and the severity of symptoms, and are agreed that the hook-worm does not cause its symptoms by its blood-sucking propensities but by some as yet unknown toxin.

Post-Mortem Findings. I have studied reports of seventeen complete autopsies upon American cases. Ashford and King, 12, in Porto Rico. Leonard, 4, Island of Grenada. Capps, 1, Chicago from Panama. These can be compared with the findings of Sandwith in 26 autopsies in cases of ankylostomiasis.

General. There is practically always edema present with marked dropsy of the lower extremities, some abdominal ascites, serous effusions in other serous cavities and considerable general anasarca. The bodies usually appear fairly well nourished, and in the adult cases quite well developed muscularly, but the intense pallor of the skin and other tissues is invariably marked. The subcutaneous and other fat of the body is well preserved, of normal amount and of light-yellow color. This absence of emaciation and preservation of normal amount of fat is in decided contrast to the findings of Sandwith⁸ in the ankylostoma cases, in which the muscles were wasted and there was usually a decided absence of fat. In his report the average weight of 100 severe cases was 117.5 pounds

where normally the weight should have been 135 pounds. In this connection the observations of Chamberlain upon soldiers with light infections is of interest. In comparing the weights of northern and southern recruits, there is a difference in favor of the northern recruits, also there is a difference in favor of the non-infected southern recruits over the infected southern recruits.

Bass¹³ in a later report of examination of students at Tulane University, calls attention to the important fact that there is a definite inferiority in both weight and stature in students who have mild infections with uncinaria as compared with non-infected students. It is to be remembered that in these mild cases there are no clinical symptoms which would lead to the detection of the disease, except by the examination of the feces.

The muscular tissue, according to Ashford and King, is brownish-gray in color, friable and often atrophied and microscopically the muscle fibers are fragmented and protoplasm reduced in amount.

Gastro-intestinal tract. The habitation of the worms is usually confined to the upper part of the jejunum and a certain number are found in the duodenum. In a few cases they have been found in the ileum, but never in the colon, and Ashford and King describe their occurrence in the stomach in several cases, both attached to the mucous membrane and unattached. In practically all cases there is a mucous gastritis, sometimes extreme. Ashford and King report two cases and Leonard two cases of gastric dilatation. The duodenum and particularly the jejunum are the seat of a severe catarrhal process which also affects to a degree the other portions of the intestines. There is a large amount of mucus in the intestinal canal in which the worms are imbedded and which is often blood stained in places. The lesions of the intestine are confined to the mucosa and there is often degeneration and atrophy of the intestinal and gastric mucous membrane.

At the point of attachment of the worms there is a tiny erosion, superficial, not deep, and about one-half millimeter in diameter. This erosion is usually not surrounded by any discoloration and is difficult to locate with the naked eye. Leonard says that the mucous membrane showed minute hemorrhagic spots, but a majority of his cases were of the ankylostoma type. These minute, superficial erosions are in marked contrast to the lesions described by Sandwith in the cases of ankylostomiasis, where there are numerous petechial hemorrhages marking the bites of the worm and some of the worms are found embedded for half the length of their bodies in the thickened mucosa, and those so attached are surrounded by much bloody mucus.

Ashford and King express the opinion that the food of the uncinaria is the epithelial cells of the mucosa and that it is not a blood-sucker. In only five cases in 10,000 was there sufficient blood in the feces to be discovered by the microscope. In examining 80,000 worms none containing blood were seen. Leonard only occasionally has seen the worms

blood-red in color. In Colbert's 21,000 cases (Porto Rico), 12 showed blood microscopically visible in the feces and in 23 was it visible by the microscope. However, by the chemical tests for occult blood, probably a much larger per cent. will be positive. McNabb at Knoxville says that in every case he finds blood in the stools by the guaiac or the benzidine test. In my eight cases, all light infections, two were positive to the benzidine test. Stiles says that 80% of the severe and medium severe cases will react to his blotting paper test for blood.

The largest number of worms removed by anthelmintic in any one case as reported (Colbert) is 4,872. The proportion of males to females of the parasites as found at autopsy by Capps was one male to four females. Sandwith in 50 cases gives the proportion in the ankylostoma infection as 56% males and 44% females. Other observations recently reported are practically in accord with the finding of Capps that the proportion is about 1 male to 4 females in the American cases.

Liver. The most pronounced change in the liver is *fatty degeneration*. In Capps' case the liver weighed 1600 grams, was mottled yellow in color. The cut surface was mottled yellow and red and cut with decreased resistance.

Ashford and King give the color as light brownish-yellow or very light yellow; it is soft, friable and greasy to the feel. Microscopically fatty degeneration was always present and in the milder cases more pronounced in the outer third of the lobule.

Spleen. Ashford and King state that the changes in the spleen are definite and characteristic. It is decreased in size, soft and has a wrinkled capsule. Microscopically the eight cases examined invariably showed a decided paucity of lymphoid elements, and even a decrease in the size of the lymphoid cells. The Malpighian corpuscles were greatly reduced in size and in cellular content. The increase of connective tissue was only relative and apparent.

Capps reported a large spleen with interstitial hyperplasia. This was possibly malarial in origin.

Leonard says the spleen was normal in two of his four cases and enlarged in two, the enlargement probably being due to malaria.

Kidneys. Ashford and King report that practically all fatal cases show a chronic paranchymatous or diffuse non-indurative nephritis. They are invariably very pale and usually slightly enlarged. In the older patients there was a slight increase in connective tissue. Microscopically the changes were most marked in the convoluted tubules, where there was fatty degeneration and desquamation of epithelium. There were exudates of serum and blood into the interstitial tissue and Bowman's capsules, and bloody and epithelial casts in the tubules.

Their findings in the urine of the severe cases correspond well with these post-mortem lesions. 20 in 24 cases had small trace of albumen before any anthelmintic treatment. 18 in 24 had casts, hyaline and granular. No bloody casts and few epithelial.

Lungs. The only constant changes seen in the lungs are the extreme pallor, as in all the other organs, and in almost all cases a pulmonary edema, as shown by the dripping of fluid from the cut surface. Many cases show signs of passive congestion, probably due to incompetency of the mitral valve. Every case is reported to have had a greater or less degree of pleuritic effusion, clear and yellow in color.

Heart. Sandwith says there was a cardiac hypertrophy in ten of his twenty-six cases. The American observers also report cardiac hypertrophy in several cases and dilatation dependent upon fatty degeneration in many of the cases. The muscle was frequently flabby and a functional incompetency of the valves was present.

Ashford and King say there is frequently an increase in the pericardial fat. In all cases a considerable amount of serous effusion is present in the pericardial cavity. Microscopically they report in two or three cases distinct brown atrophy and in two cases extensive fatty degeneration.

Brain. About the only constant lesions described in the brain are intense anemia and an effusion into the ventricles of a clear pale yellow fluid.

Bone Marrow. The marrow of the shafts of the long bones usually has undergone changes somewhat similar to those in pernicious anemia, although Capps in the description of his case says that the marrow of the femur was extremely yellow and fatty. "At two points it had a reddish color but was even here practically all fat."

Ashford and King examined the shaft of the femur in two cases. The marrow was grayish-red and very soft. Microscopically it was similar in appearance of pernicious anemia (which probably means it contained an abundance of erythroblasts) and also contained numerous groups of eosinophilic cells mostly myelocytes, as well as large numbers of myeloplaxes.

Hemolymph Glands. Ashford and King lay great stress upon changes in hemolymph glands. In two cases in which search was made numerous hemolymph glands of considerably larger size than the normal type were found in the region of the abdominal aorta. Most of these were of the spleno-lymph variety.

GROUND-ITCH.

The etiological relationship of the so-called ground-itch to uncinariasis can be considered to be proved beyond any reasonable doubt. In 1901 Loos first showed experimentally that the larvæ of ankylostoma enter the skin through the hair follicles and penetrate the deeper tissues. This entrance has been repeatedly demonstrated since.

All of the descriptions of the symptoms, lesions and sequence of events in ground-itch either accidental or experimental in origin are in perfect accord, and have been most accurately described by Ashford and King⁹ and by Claude Smith.¹¹

According to Ashford and King the exposure of the skin to the larvæ causes the following symptoms:

1. Itching within a very short time.
2. Followed by redness and swelling of part.
3. In two days papules appear.
4. These rapidly change to vesicles, discrete or often confluent which later usually rupture.
5. Frequently followed by pustules, but in favorable cases pustules do not form.
6. In case pustules do not form the vesicles soon begin to dry up and crusts form and in the milder cases not forming pustules, the lesion completely subsides in a week or two.

7. In the more severe cases in which the symptoms are probably due to secondary pyogenic infection, extensive and deep ulcers form, which sometimes respond well to treatment but often are very resistant.

Claude Smith has shown that a toxin may be extracted from the larvæ by alcohol which will produce the itching and other changes of ground-itch but in a milder form.

Colbert reports that in 5,000 cases of uncinaria, 4,956 gave a typical history of one or more preceding attacks of ground-itch.

Ashford and King say that 95% of 12,000 cases gave such history.

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THE EARLY SYMPTOMS OF PELLAGRA.*

By C. C. BASS, M. D., of New Orleans.

In this paper it is intended to call attention to some of the early symptoms manifested by a few of the cases of pellagra seen by the writer during the present year. Special attention is invited to the symptoms prior to the development of the classical skin manifestations which permit a positive diagnosis of pellagra to be made. I believe that, for the present at least, a positive diagnosis of pellagra is not warranted unless the skin lesions are present, though it may be perfectly practical to make a probable diagnosis in some cases if seen this early and if this disease is kept in mind.

In order to get the general symptoms well before us, let us first consider briefly the symptoms of well established pellagra; then we will take up histories of cases throwing light on the subject under discussion.

The symptoms are conveniently classed under three heads: (1) Those affecting the cutaneous system; (2) those affecting the digestive system, and (3) those affecting the nervous system.

The skin lesions vary from a mild erythema resembling sunburn, to the most severe type in which occurs large vesicles or bullæ, leaving a raw, red, weeping surface. In the milder lesions the erythema is followed in a week or two by a dry, cracking, exfoliating condition. The skin affection is most constantly, and usually earlier, found on the backs of the hands, but may involve the skin over any part of the body. The exposed surfaces seem most liable to be affected. The prepuce, scrotum, vulva and vagina are especially liable to show erythema. The palms and soles are seldom, if ever, involved. The lesions are bilateral.

The symptoms relative to the digestive system may be salivation and red-edged, sore tongue. There frequently are large papillæ on the tip and edges. There may be ulceration, especially on the under surface. The inside of cheeks or lips are frequently ulcerated. Anorexia, "indigestion," nausea and vomiting are frequently the symptoms for which the patient consults the physician. Diarrhea, amounting to from two to twenty loose stools per day, is usually present at some time of the disease. There is sometimes dysentery. More or less weakness and emaciation are present, depending, no doubt, largely on the malnutrition, but probably also on damage to the nervous system.

Most early and mild cases show exaggerated reflexes. Melancholia, insomnia, excitability, hallucination, insanity or other mental disturbances develop sooner or later in most cases.

*Read at the meeting of the Southern Medical Association, New Orleans, 1909.

In their order of frequency of presence these symptoms in established cases of pellagra will be found about as follows: Erythema, diarrhea, gastric symptoms, stomatitis, vaginitis in females, weakness and emaciation, mental and other nervous symptoms. Exaggerated reflexes are present in nearly all early cases but are absent towards the time of death.

Diarrhea is the next most important symptom to the skin lesions. One of the cases seen, however, gives a clear history of a well marked case of pellagra four summers ago, including the erythema, and attacks each summer since. She claims not to have had any diarrhea at any time. A severe attack this summer proved fatal in about two and one-half months, during which time constipation was a troublesome symptom. A review of a comparatively small number of cases seen by the writer, twenty-eight in all, cases can be found in which any one or more of the above symptoms were absent, except, of course, the skin lesion, without which the diagnosis has not been thought warranted.

A case very recently seen, through the courtesy of Dr. S. K. Simon, gives the interesting history of having to wear gloves when exposed to the sun for the past twenty-nine years, but did not develop any other symptom of pellagra until this year.

Another case, recently seen, has been unable to do his work for two years on account of weakness, diarrhea and nervous symptoms of pellagra, but gives the history of having been subject to attacks of diarrhea for at least ten years, and for six years he has been forced to wear gloves to prevent sunburning of hands. He has now well marked typical pellagra. It would seem, therefore, that the erythema may be one of the very earliest symptoms of pellagra.

In a recent study of 100 cases in the Peoria Insane Asylum, Capt. Siler, of the U. S. Army, found a few cases with no other symptoms of pellagra but the skin manifestation. Therefore, the erythema may be an early symptom of the disease. Further histories will show, however, that it may be the latest symptom to appear.

Another case gives a definite history of having been troubled with diarrhea and indigestion, especially during spring and summer, for twelve years. Fifteen years ago he got much better of this but was troubled occasionally since, until this summer, when he took severe diarrhea, weakness and emaciation. His hands show the characteristic erythema which he says he has had for the past two months. He also had trouble with his hands getting sunburned each of the two previous summers, but never as bad as now. I believe this history indicates that diarrhea may be an early symptom, and in this instance, with indigestion, the only symptom of a disease which after many years has proven to be pellagra.

Another case, indicating the same thing, has about the following history: Sixteen months ago she developed sore mouth and tongue, indigestion and diarrhea. She also had "female trouble," as she called it, which on inquiry was found to have been pruritis and probably vaginitis. She got better during the winter but developed some symptoms the next

spring. She was in the hospital about three weeks with the above symptoms, and even enough mental disturbance to have to be watched to prevent her going away. Within ten days of her death she developed blackening of her knuckles which increased to the typical acute skin lesion in the negro. Her mother says she never had any such condition on her hands before, and that her beautiful skin was often the remark of her associates. I submit that this patient had the other symptoms of pellagra for more than a year before any skin evidence appeared. Diarrhea and vaginitis were early symptoms in this case.

A very severe, fatal, so-called wet case gave the history of having had two summers ago diarrhea, weakness and some "female trouble." This was irregular menstruation and vaginitis and pruritis. She improved during the winter to take the same troubles the next spring, sufficiently severe to incapacitate her for her work—cooking. She improved during the winter again, and this spring developed it again. After having had diarrhea and pruritis over a month she took for the first time blackening of her hands. When first seen she had severe pellagra with the severest skin lesions on hands, elbows, neck and vulva, and died within two months of its appearance. I submit that this patient had had for two summers the same symptoms of diarrhea, pruritis, vaginitis, and weakness that she continued to have in a greater degree after she developed the skin lesions permitting a diagnosis of pellagra. She also gave a history of one summer, having stomatitis and her mother says her mind was so deranged at times that she would leave home without excuse for many days at a time. The patient explained that the condition of her hands was the working out of poison introduced into her by a "hoodoo" woman who treated her female troubles by steaming her with moss. This complaint of vague, or sometimes definite, female troubles has been a very constant part of the history in practically all the cases of pellagra in women I have seen. It has more than once been the trouble for which the patient consulted the physician. In a paper read at the National Conference on Pellagra, by Dr. Saunders, this fact was noted and the pelvic condition and symptoms had been studied in a large number of cases. The cases studied were in the insane asylum and therefore the histories not likely to have shown what those of another class of patients would show. Careful examination showed that most of her patients had more or less redness and inflammation of vagina and vulva.

This was found in many of the cases on first examination, and while the case was yet early, at least so far as the skin lesion was concerned. Menstruation is disturbed, usually irregular, scanty or absent early in many cases, and this coupled with the presence of some actual irritation serves to soon disturb the patients often already somewhat unbalanced in mind on her female condition. How early in the disease these may be prominent symptoms is illustrated by the following case:

A young woman was seen whose chief idea was that she had some female or womb trouble and was brought to consult specialists for it.

The only actual symptom she could point out was that she had missed two menstruations and afterward had had only a short period. This occurred in the spring. She had poor appetite, but no diarrhea or other gastrointestinal disturbance. She had some hallucinations, and spent most of her time talking on religious subjects. She was very weak. On examination no pelvic trouble was found except possibly a little irritation, and in fact nothing else of note could be found in the case, except her mental condition. After this condition had continued for nearly three months and she had been admitted to an insane asylum she developed the other symptoms warranting a diagnosis of pellagra. In this case then, the mental condition, a form of insanity, was the earliest symptom present and was present over three months before the diagnosis of pellagra could be made.

One other illustrative case should be mentioned: A woman gave the history of "indigestion," anorexia and occasional vomiting for a month or two. No pains. She was weak and had lost a little weight. Diarrhea occasionally, supposed to be due to food. Low HCl acidity of stomach contents was found, and what was thought to be a small pyloric tumor was felt. At operation this was removed, and probably was malignant, but no microscopic diagnosis was made. She recovered from the operation, unimproved generally, and developed well marked pellagra about three months after operation and died within two months. The gastric symptoms were the earliest in this case.

From a study of the cases, related, and many more from which these are selected, I would conclude that any one or more of the symptoms of pellagra may be early or the earliest in a given case. I would further conclude that any one or more of them may be late in their appearance or may be absent.

Many of the cases related could not have been diagnosed had they been seen earlier, and therefore I believe that with our present knowledge of the subject, what we are now diagnosing as pellagra is often the late manifestation of a disease that has existed for months and sometimes many years.

The early symptoms are so vague and variable that in most cases we are now unable to make a diagnosis until the terminal stage. We may, however, be able to make a few diagnoses earlier if we keep pellagra in mind in considering the indications of such symptoms as stomatitis, diarrhea, indigestion, general debility, vaginitis and pruritis, symmetrical erythema, and undiagnosed mental conditions, especially when exaggerated reflexes are present.

SOME OBSERVATIONS ON TETANY.

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The first known reference to tetany was in 1830 when Steinheim, a German writer, suggested a connection between it and acute articular rheumatism. Dance, in 1831, recorded some observations upon a form of intermittent tetanus, as he called it, and following him there were various descriptions not well differentiated. General attention was first called to the subject by Trousseau in 1845. He believed the phenomenon to be of "a very distinct species," and, as his first cases appeared in nursing women, he spoke of the condition as "rheumatic contractures occurring in nurses," but before long perceived that lactation was not the only condition favoring the development of the affection. A few years later contributions to the subject were made by Lucien Corvisart, while the work of Erb and Chvostek is recognized in the signs called by their names.

It is possible to define tetany as a condition depending upon hyper-excitability of nerve tissue, characterized by tonic spasms of the extremities, either paroxysmal or continuous. The position of the affected limbs during the attack is pathognomonic,—the thumb is bent in across the palm of the hand, the straight and rigid fingers are strongly flexed at the metacarpophalangeal joints; the wrists and elbows are flexed, and in severe cases the forearms are drawn inward and forward. Spasm of the lower limbs is more rarely seen and shows itself as flexion of the toes, equino-varus position of the feet, and still more rarely as flexion of the knees.

These patients usually recognize the oncoming of an attack by feelings of "pins and needles," "tightening of the skin," etc. As the spasm proceeds actual pain develops in the contracted muscles. One or more limbs may be affected and in many cases certain face muscles share in the disturbance. In that event, there may be only a feeling of constriction, as if the skin were drawn tightly or there may be actual spasm interfering with the movements of the jaw. The contractions, which are tonic in nature, may last a few minutes, several hours, or even be continuous for days. Numerous attacks may occur daily, or months may separate them. When the condition exists, however, "latent tetany" so-called, certain phenomena may be produced.

(1) *Trousseau's sign.* Pressure in the region of the great vessels or nerves of the arm reproduces the attack or may increase the severity of one already evident. This is conveniently accomplished by the arm band of a sphygmomanometer exerting sufficient pressure to obliterate the

radial pulse. While it seems more probable that the phenomenon is due to the additional irritation applied to an already overexcited nerve trunk, still there may be some influence arising from the interruption of circulation. Thiemich considers the presence of this sign diagnostic but its absence in a given case is of no significance.

(2) *Chvostek's sign*. Percussion of the facial nerve somewhere along its course results in some cases in spasm of the muscles which it supplies. A suitable location for eliciting this sign is midway between the zygomatic process and the angle of the jaw.

(3) *Erb's phenomenon*. This consists in hyper-excitability of the peripheral nervous system to the galvanic current particularly, and the production of "anodal opening tetanus," found only in tetany as far as is known.

For permission to report the first case given below I am indebted to Dr. L. F. Barker, in whose service in the Johns Hopkins Hospital, I was able to study the case.

Case 1. M. M., a German woman, married and thirty-nine years of age. She was first seen January 3, 1907, complaining of "pains in the stomach, vomiting and spasms."

Past history: The woman previously has been healthy, speaks of an attack of "malaria" ten years ago at which time she also had spasms like the ones of which she now complains. She is the mother of eight children, has always been obliged to work hard and content herself with poor, irregular meals. She weaned her youngest child to come to the hospital.

Present illness: The present symptoms are of about six months standing, during which time she has lost thirty pounds in weight. She has experienced feelings of fulness in the stomach coming on after dinner and in the evening, gradually increasing to actual pain, particularly after the ingestion of greasy food. Vomiting gives relief and in the vomitus she has noticed remains of food eaten many hours before. Her first attack of "spasms" was ten years ago coincident with the attack of "malaria." The present seizures appeared about two months ago and have been, she believes, more likely to appear after she had eaten greasy food, but also if she became frightened or nervous. The "spasms" continue from a few minutes to several hours in duration and occur about four times a week.

Her attacks begin in the fingers with "feelings of numbness" and "pins and needles." The thumb is first bent in and the rigid fingers bend at the metacarpophalangeal joints. When an attack is severe the region about the eyes and even the whole face has the same sensation as the hands. The patient believes that the attacks are worse on occasions when vomiting is impossible, and at any rate relief comes after emesis.

Physical examination showed a mass in the thyroid gland. In the epigastrium a definite firm slightly tender tumour mass. Trousseau's sign was elicited in the left hand and arm to which pressure was applied. There was no accompanying phenomenon on the right side. The stomach

was found considerably dilated and its secretion contained no free hydrochloric acid.

Diagnosis: Probable cyst of the thyroid gland; carcinoma of the stomach; tetany.

On several occasions the patient complained of paresthesias and these were followed by a contraction of the muscles into the tetany position while the patient moaned with pain. Chvostek's sign was never elicited.

January 7th: Pressure of 120 mm. of mercury applied with the sphygmomanometer, this being just above the determined systolic blood pressure. After one minute the patient spoke of paresthesia and in two minutes there appeared the characteristic spasm of thumb, fingers and wrist. A little later, diastolic pressure was applied with slight response though the muscles were somewhat contracted. At systolic pressure again, the pain was increased but spasm was not produced. After a short rest, a pressure of 280 mm. was applied for three minutes without characteristic response. The electrical responses, tested the same day, were not markedly increased, whereas the mechanical irritability of the muscles was increased.

January 14-18: No tetany could be elicited by pressure of 300 mm. of mercury for two minutes.

January 20th: Patient not feeling well; had pain in stomach. Spontaneous tetany occurred but even on this day no Chvostek's sign could be demonstrated.

The patient was then transferred to the surgical service for relief of the gastric stasis.

CASE II. K. N., female, 39 years of age. Married. Seen March 8, 1908, complaining of "drawing feelings in arms, legs and left side."

Family history: One sister has described similar feelings. Mother said to have had a "goitre" about the size of a hen's egg.

Past history: For years patient has had indigestion with eructations of gas and occasional regurgitation of sour food. No severe pain or actual vomiting. The trouble has been alternately better and worse. There appears to have been some indefinite and transitory swelling of the neck (thyroid region) in the last two years. The patient has had four children, the youngest now three years old.

Present illness: The present trouble began in 1905 (when patient's youngest child was four months old) with peculiar sensations in the back of the legs extending up the back also, and there were "drawing feelings" in the back of the neck. In January, 1908, she noticed prickly feelings in the left third and fourth fingers and along the ulnar side of the forearm.

The latest attacks began about one month before admission to hospital, when the "drawing feelings" became more definite and on one occasion when both hands and the left foot were affected, the thumbs closed in, the fingers over them and the elbows were flexed. Two or three of

these attacks occurred daily for a week, one lasting about three hours accompanied by severe pain. At one time the jaws were clenched. There was a sensation of tightness over the face, and for some days afterward the jaws could not be opened widely. As a rule the attacks were more likely to occur two or three hours after dinner.

Physical examination: Patient sparsely built. There was no enlargement of the thyroid gland nor abnormality in the movements of eyeballs or lids. The deep reflexes were exaggerated but there was no clonus. An attempt to produce Trousseau's phenomenon was followed by paresthesia in the hands and then by the typical tetany position, all of which the patient said corresponded to her spontaneous attacks. The sign was repeatedly elicited in the following days but Chvostek's sign was never produced.

It seems probable that both these cases are to be classed as lactational tetanies though the dilated stomach and stasis present in the first case is not to be forgotten.

Even a casual glance into the various text books shows that the subject is still in a transitional state. The best clinical classification is probably that of v. Frankl-Hochwart, as follows:

(1) In connection with acute infectious diseases as typhoid fever, influenza, scarlet fever, etc.

(2) With gastrointestinal disorders, more particularly gastric dilatation.

(3) In children, having nutritive disorders as a basis perhaps.

(4) An epidemic, or so-called idiopathic, form, occurring acutely, known also as shoemaker's cramp.

(5) Associated with such diseases as osteomalacia, rickets, etc.

(6) Occurring with lactation and pregnancy.

(7) Following extirpation of the parathyroid glands.

The underlying cause of tetany is evidently something which brings about heightened excitability of nervous tissue both sensory and motor, resulting in muscular spasm, either spontaneous or produced by added irritation. Recent experimental work goes to show that the parathyroid glands are probably connected in some way. These glands are usually four in number varying considerably in position, form and size, but as a rule oval or spherical in shape and yellowish in color. They are commonly in pairs, the upper pair lying on the postero-internal aspect of the thyroid gland in many cases at about the level of the junction of the upper and middle thirds of the lateral lobes. Occasionally one may be found even above the superior border of the gland. The lower or internal pair are rather nearer the median line and more commonly are about at the lower border of the thyroid gland, but may be found on the anterior surface of the trachea as low as inside the thorax. As Evans has shown, each parathyroid has a distinct artery of supply, usually coming from the inferior thyroid artery but not infrequently from an anastomosing channel between the superior and inferior thyroid arteries.

Gley, in 1891, was the first to suggest that tetanic symptoms following thyroidectomies were due really to simultaneous removal of the parathyroids. Since then, however, many exhaustive examinations and many experiments have shown that tetany may be produced by destruction of the parathyroids and further that there is probably a close connection between the various forms of tetany and parathyroid insufficiency.

In this connection the recent work of MacCallum and Voegtlin has led these authors to the conclusion that "in tetany there is apparently some disturbance in the composition of the circulating fluids ordinarily prevented by the secretion of the parathyroid, which disarranges the balance of the mineral constituents of the tissues." This disarrangement is essentially in the nature of excessive excretion of calcium salts from the tissues. "The parathyroid secretion in some way controls the calcium exchange in the body. * * * * The mechanism of the parathyroid action is not determined but the result, the impoverishment of the tissues with respect to calcium and the consequent development of hyperexcitability of the nerve cells and tetany is proven."

This explanation of parathyroid insufficiency is easily applicable to most of the classes of tetany previously mentioned. It is sufficiently obvious in the cases of extirpation of the glands. Osteomalacia and rickets are conditions in which the tissues are notoriously deficient in calcium. During the latter months of pregnancy the calcium demands of the fetus upon the maternal organism have been shown to be rapidly increased and the amount of calcium contained in human milk is plainly also a drain upon the system. In the cases of so-called gastric tetany, however, the connection is less obvious and further work is required.

In the presence of the typical spasm as described there can be practically no difficulty in recognizing the disease. During the intervals, Trousseau's sign may be elicited, and it is probably safe to make a positive diagnosis in any case presenting it, but since it is variable, being present at one time and absent at another, repeated trials may be necessary.

Hysterical seizures may present difficulties, but attention to other stigmata should make differentiation possible. The two might occur together.

Tetanus could scarcely cause confusion since there is usually the history of an injury and there is fairly constant stiffness in the jaws between the convulsive attacks, which, too, are most marked in the trunk in contradistinction to the involvement of hands and feet in tetany.

Osler speaks of transient spasms of the hands and feet, more rarely of the arms, occurring in rickety children and under the name of carpopedal spasm excludes them from true tetany. It is not improbable, however, that the etiological factors are the same.

The outlook depends on the causative factors in each case. In the post-operative groups severe attacks may be fatal unless quickly controlled. The final outcome rests upon the possibility of some remaining

tissue recovering functioning powers, perhaps through hypertrophy. It is conceivable that some post-operative conditions are manifestations of a relative insufficiency soon tided over. The cases dependent upon drain of the calcium content of the tissues are favorable in so far as the underlying condition is amenable to treatment.

From the recent work of MacCallum and Voegtlin, it has been shown that the spasms can be almost immediately controlled by the exhibition of calcium salts by mouth, per rectum, hypodermically, or preferably for most rapid action, intravenously. For the last method a five per cent. solution is convenient. Copious bleeding before the injection of the calcium solution seems to be of service. Preparations of parathyroid gland are indicated when the symptoms are present over any considerable time and may be administered as fresh minced gland, in the form of a dry powder or hypodermically as nucleo-proteid. Transplantation of parathyroid glands into thyroid or spleen has been suggested but is still in the experimental stage.

The general condition and particularly nutritional disorders should receive appropriate treatment. The possibility, however, of controlling the spasms, while measures are being taken to treat the underlying condition is of the greatest importance.

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SPECIAL ARTICLE.

THE TREATMENT OF PULMONARY TUBERCULOSIS WITH TUBERCULIN.*

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Translated by Carl Fisch, M. D.

The task imposed on me for a high standing congregation of representatives of medical science to introduce a discussion of such an important and at the same time little understood problem of practical medicine as the tuberculin treatment of pulmonary tuberculosis, I would compare to a sweet smelling rose with pointed thorns. The task is honorable, but, unfortunately, is accompanied with sharp thorns, too.

In the present state of our knowledge, the question of tuberculin is certainly not ready for general acknowledgment, and for that reason I do not expect the following communication to find general acceptance. But this shows that it is an appropriate time to bring this subject, full of many obscure questions and carrying so many delicate features, before an international forum, thus effecting an international exchange of thoughts.

In the beginning, let me say the literature about the tuberculin treatment of pulmonary tuberculosis is so gigantic, I might characterize it as acromegalic—that no mortal can familiarize himself with the whole of it, much less interpret it logically. I must be allowed at this time to remind you of the words of a poet, “brevity is the soul of wit,” and to touch at this time only single yet general points of view leaving aside the details. And the first thing I leave out is the literature that already has been published on the subject. To go over it, to analyze and criticize it would be “Torture of Hell.”

If a thousand years ago the classic Seneca complained, “Literarum quoque in temperentia laboramus” (in science we must work with moderation) and if the genial Frerich said as long as thirty years ago, whether still one of us is capable of reading only one-half of the medical literature of the world and digest it, “how must, at the present time, the investigator feel, when books, journals and other publications grow like toad-stools.” On the other hand it would be impossible to differentiate

*A report of a paper read at the XVI. International Medical Congress at Budapest, 1909. *Berl. klin. Woch.*, 1909, No. 38.

in this gigantic material the grain from the chaff. It can only be said that this literature consists of a mixture of truth and fancy, and more of the latter than of the former. I also apologize for not referring to the statistical data about the positive results of the tuberculin treatment, the more so, since most statistical conclusions do not mean anything. This puella publica of science, as it is often called, ironically, can prove much or little, according to the personal view on the subject and the capacity "de grouper les chiffres." Additionally, the statistical figures in this direction refer to an entirely unequal number of patients, therefore do not permit of any comparison. Finally, the greatest weight in the observations lies in the individual views and mental receptivity of the attending physician. The subjective factor "Moment," called by Koehler in his ingenious work the temperament of the observer, is likewise in this question decisive and interferes with a true interpretation of the figures. Not every physician has the quality to observe with impartiality and finally arrive at conclusions without bias.

The so-called theoretic principles of treatment with tuberculin I do not discuss here equally. These are immensely complicated problems. Their discussion cannot be done without discussing the highly complicated problems of biologic investigations. For this, rest and quiet are the necessary factors.

We must, also, always remember that our knowledge of the first details of the processes which play a part in the natural and the artificial recovery from tuberculous infection shows many discontinuances in the line of evidential data. We are justified, therefore, in asking whether at this time a conclusive discussion over these delicate and fine biological problems is altogether possible. I believe that in this way we will soon lose the firm foundation under our feet and waste our time with speculative, insufficiently founded, theoretic excesses. Very fascinating problems of nature are always greatly complicated and usually more complicated, than in the beginning we think. Therefore, altogether simple problems of so-called natural processes do not exist.

Again I repeat, that animals in the laboratory react altogether differently to the tuberculous virus than the highest and most firmly organized product of creation,* "that with more or less justification may be called the homo sapiens." As instructive and stimulating as the results of experiments on animals are, they can be utilized only with *grano salis* for pathologic processes in man. It is also unnecessary to insist that in the living organism immensely complicated so-called vital processes obtain, that are now only guessed at and nevertheless do their important work; processes that in the dead test tube are eliminated entirely. For me it is not a question that these fundamental differences are not always sufficiently considered in medicine.

*This word must not be taken as an indication of the belief of the author in creation, it is only a convenient word for the occasion. The Translator.

I remark here that also the theoretic argument favoring the use of the tuberculin therapy, however rational its principle may be, still meets with many obstacles. I call attention occasionally only to these points.

(1) That a high amount of antibody content of the blood, as well as an immunity against tuberculin is in no way identical with the work of immunity against the tuberculous virus itself.

(2) That tuberculin in certain respects is an impure substance of unequal constitution and of inconstant, indeterminable capacity; that it cannot with certainty have any influence on bacilli present in the organism; and that it can only produce a toxinimmunity, a so-called focal reaction.

(3) That an absence of reaction against tuberculin does not mean insusceptibility to tuberculous virus. We know that under these circumstances acute exacerbations of the pathologic process are observed.

(4) The question, why an artificial introduction of tuberculin may cause curative reactions, while the spontaneous autoinoculation does not always do so, cannot be satisfactorily answered. One must base such a conclusion on well founded facts, and not on theoretic considerations.

I hope that these remarks will not be construed as reflecting upon the value of the experimental investigation—or the work of the laboratory. As always my conviction is that experimental pathologists in the first place are able to lead us on in knowledge; they must now, and in the future, do the same. I am fully impressed with the high, scientific importance of theoretical investigation. I consider this also as a necessity for an advancing growth of clinical pathology.

It is, however, true that the decision about the real value of or about its real importance of the experimental findings and the theoretic interpretations can only and alone be given by the clinical observation. Theodore Frerich, uttered these prophetic words in 1882: "The foundation of our work, the real source of our recognition is, and always will be the observation and study of the diseased individual. They alone decide in the last the questions, the answers, which we may trust." These classical words have not lost any of their importance even now, although they have been forgotten by our younger generations.

The trouble is that the apparently simple, impartial and objective observation at the sick bed and correct interpretation of these observations is immensely difficult. The sources of error are many and mistakes are frequent. It is to be regretted that the clinical observation wisely praised by our predecessors as the only way, has lately taken a place in the background, and reliability of laboratory work and theoretic speculations have been overestimated to such a degree that the clinical examination is only considered a sort of appendix of the laboratory and that the diseased individual is regarded as a kind of a test tube. This tendency, certainly very regrettable, cultivates too easily laboratory clinicians instead of exactly observing physicians, who deal with the sick not as an object for observation merely, but as an object of our care or help. My opinion

is still the same, but I believe that this point of view is considered to-day as obsolete and that the sick person is the center that cannot be spared in the proper conduct of a clinic. In this direction many lamentable results have followed; and this obtains especially for the study of tuberculosis.

Since Robert Koch's epochal discovery, in 1883, of the small, imotile bacillus, the latter has up to this time played a rather too important part, in spite of its important etiologic character, and has lessened attention to the clinical dealing with tuberculosis. Only too frequently the results of examination of the sputum and the condition of the lungs were, and still are, overrated, and little attention paid to the patient, especially in a psychic-moralistic direction, as if sick lungs and not sick individuals with heart and soul were under our care. The physician dealing with tuberculosis should not be a specialist in the strict sense, but ought to be a uniformly informed man with, above all, psychologic ideas.

The following points are frequently not considered:

1. That many anomalies in the physical examination of the chest must be interpreted as reactive, and even as favorable signs of attempts at improvement, that, therefore, do not need special attention.

2. That without doubt apex changes are not always only tuberculous.

3. That almost any autopsy shows the evidence of cured or at least quiescent tuberculous affection, proving that we must be delighted with the presence of this spontaneous, natural tendency to cure many tuberculous processes. They are due to the individual resistance and the richly endowed powers of defense of the sick organism. The cases of so-called harmless tuberculosis are very frequent,* "in fact comprise almost all human beings that do not die from tuberculosis."

4. That the local changes of the tissues of the lungs, in other words, the anomalies found through the physical examination, are not primarily competent for the estimation of the single case, although, of course, they are not to be neglected. The main thing is the reaction they have on the organism. A patient with good appetite, no rapid pulse, no fever, whose constitutional condition is not greatly depressed and who is not very poor, is not in great danger if the lungs are not involved extensively. Many clinically demonstrable cases of pulmonary tuberculosis get well without any special therapy, that is, without any specific remedies or without sanatorium treatment. Their trouble comes to a functional cure or to an arrest with only rational conduct of life, and often even without this.

In spite of these four facts, to-day every patient is considered as seriously sick and as a candidate for consumption. They are frequently worried with unnecessary and excessive cures, tuberculin, sanatoria, rest and food cures. Much money is spent uselessly and the physician highly honored and recompensed, but, on the other hand, much unneces-

*(Translator.)

sary psychic depression is produced in the patient and his relatives. It is an individual art of a physician to select cases that need a more vigorous treatment and those that need only the improvement by a rational life and a suitable occupation. These qualities characterize a true physician.

Finally, the making of the diagnosis is often faulty. I readily admit that the physical examinations of the lungs, especially the apices, is one of the most difficult tasks of diagnosis. How often an apex infection is wrongly diagnosed, only the arbiter who is consulted for confirmation can tell. As soon as the smallest suspicion of a tuberculous process is suggested, invariably changes and rales that do not exist are found in the lungs. Physicians know that in almost every person apex affections can be diagnosed by forceful percussion and auscultation, and what is more, that these patients have to undergo the treatment for a clinically established tuberculosis. Many individuals are treated as tuberculous in whom, clinically, the disease tuberculosis is not found, and is diagnosed by such insignificant changes that would without any extensive treatment, have disappeared. These experiences throw a strong light on the enthusiastic interpretation of the statistics of recoveries.

This faulty diagnosis in so many cases has been increased in frequency since the late insistence of the demonstration of an initial tuberculosis so that the treatment can be commenced as early as possible. It is true, this principle is correct; but one must not extend it to cases where the disease is not yet there, and above all, not submit individuals to tedious, expensive and at the same time bodily and mentally taxing methods.

Like all principles, this one has its exceptions. First, as in cancer, the individual characters of pulmonary tuberculosis are of more pathologic and prognostic importance than the stage of the disease. Many cases and especially the acute and those in which the infection begins with multiple foci, are very serious, and even in first periods of the disease offer a bad prognosis, while others, even in later periods, allow of a tolerably good prognosis in regard to improvement and duration of life. Here the general condition of the patient (pulse, temperature, appetite, general nutrition and blood character) is almost always of greater importance than the local changes in the lung tissue. What physician of experience has not often noticed the contrast between the general constitutional condition of the patient and the extent of the pulmonary changes?

This whole discussion proves conclusively, and that is the point I wish to emphasize, how extraordinarily difficult it is to answer the question of the therapeutic value of tuberculin treatment in pulmonary tuberculosis. I have shown how multifarious are the sources of mistakes in this subject, and how in this question, as in the whole practice of medicine, *the subjective judgment of the observer, that is to say the individuality of the physician*, is of decisive importance. Double precaution and stringent criticism are strictly necessary.

Is it true, that experience at the bedside has by this time, furnished enough evidence for the decisive word and stamped tuberculin to be a reliable curative agent? In looking over the literature, it appears that this question, in part, may be answered "yes." If a superficial estimation of the reports is made, this answer is the conclusion, but by a close estimation of all this immense literature, the question appears not yet definitely answered. It is true that general experiences in sanatoria and by specialists in tuberculosis suggest on the whole that the answer is true.

In 1890, however, Robert Koch's method of treatment with relatively high doses of tuberculin was published, and the whole civilized world was enthusiastically aroused, and set to admiring and wondering. Of course, this enthusiasm to many afflicted persons gave the hope of regaining health. Wonderful results were reported, but as to facts, only failures were the result. Other products of specific substances for the cure of tuberculosis, even recommended by learned men, could be called down by the same experiences after their use. This shows the immensely great difficulty to make an exact and impartial observation at the sick bed and the fact that the longer tuberculin is used the more does it, *per se*, not prove anything. Some of the afflicted in the first place force physicians to the tuberculin treatment, to an active therapy, instead of rest, pure air and good and copious food. Second, certain physicians have been blind to the impression they made on the public involuntarily by using the tuberculin in their cases. This led, of course, to objections of other physicians, their evidence not being accepted for lack of practical familiarity with the subject. So they, too, were compelled, though obtaining comparable negative evidence, to use tuberculin. These are not very pleasing remarks, but they are not to be overlooked in the problem.

It would also be miraculous, almost overturning the views of the world, and the greatest acquisition of our new century more important than all other discoveries, if tuberculin could be considered as a reliable remedy for such a widely distributed disease as tuberculosis. It is, however, safer not to raise our expectations too high. All efforts to cure tuberculosis rapidly, a *chronic* disease, start out from an erroneous conception of the processes of healing in it. The expectations and claims cannot be therefore so high. Justly, Petruschky in this sense proposes a treatment of tuberculosis in stages.

It is certainly immensely difficult to obtain conclusive evidence of the beneficial curative activity of the tuberculin from histories of cases, since in the same cases there is evidence for other procedures. Clinical medicine is no mathematical science, and positive evidence can, therefore, not be given and must not be asked for.

For the present one can only attempt to form an idea on the surprising frequency, by which a startlingly rapid, formerly not expected and not achieved improvement of the local and general status of patients coincides with a tuberculin treatment. It is above all desirable

to treat a large number of cases prognostically apparently identical, specifically and not specifically, and to compare exactly temporary or permanent results with both methods. This comparison has so far not been made and it must be said that it will be very difficult to find a material of that character.

I do not dare to doubt that by tuberculin used on exact indications and *lege artis*, in cases fit for it, a favorable or curative effect is brought about. Many experiences published by reliable observers allow of no other interpretation. I admit this gladly, but the number of these cases is small in view of numberless experiences that cannot prove anything for the curative action of the tuberculin, and, in spite of that, are asserted to be positive cases. Especially, the so-called initial cases cannot be evidence in any case. My opinion is, that the cases most apt for evidence of the curative effect of tuberculin are those that are stationary, and, in spite of favorable circumstances, do not show a further tendency to improve. In these, in fact, a careful tuberculin administration will bring about the desired improvement.

Much more numerous are the cases in which to experienced observers the tuberculin is not indicated, but which are nevertheless treated with it. Many physicians are optimistic in this line, some can be called "syringe cranks." The opinion of these, if not based on quiet and well arranged observation, and in which suggestive, real, accidental and other curative effects are not differentiated, cannot be considered in the discussion about the curative effect.

Excluded from treatment with tuberculin as far as the experience goes, are the following conditions:

1. Most of the acute febrile cases.
2. The cases far advanced with extensive changes of the lungs.
3. Those cases in which the constitutional capacity has been greatly reduced.
4. Very nervous patients; as a rule, nervous patients are doubly sick.
5. Patients that have a tendency to hemorrhage. On the basis of what I have seen myself, I have no doubt that injections of tuberculin can cause hemorrhage in the diseased lung. Unfortunately the extent or the consequent effect of the bleeding cannot be predicted.

Finally, it might be recommended that during intercurrent troubles, although very insignificant, and also during menstruation or during nervous attacks, the injections be omitted. Great precaution is also necessary in cases where in spite of satisfactory general conditions the local changes are very marked. The danger of undesirable local or focus reaction is not excluded. A relatively good general status of the patient, that is, a certain reserve of resistance and defensive power, is the first condition in all cases submitted to tuberculin treatment, a condition *sine qui non* for the administration, for the reason that the diseased organism is not without power to be protected against the always possible and undesirable side-effects of the tuberculin. It is a pity that the treatment is contraindicated just in those cases when it is most desirable.

This is my opinion on the question that the indications for tuberculin treatment are limited.

Details of the treatment I omit. There is such diversity of opinion in every direction of this problem, in relation to selection, change, dosage and the preparations, on the length of time of the course, of valuation of or fear for local reactions, of influence on sputum and tubercle bacilli, on fever, etc., that I would not know where to begin or where to end. The many tuberculin preparations are not sufficiently and systematically examined and studied. The internal application of these preparations I leave aside also; however, this method for easily understood reasons, must be inferior to the subcutaneous method. Already there are difficulties in selecting a preparation for treatment, as the number of preparations steadily increases and each has its apostle. Whether this is a good sign or not, an indication of a certain degree of dissatisfaction, the future will tell.

Here I call attention only to the fact that even the views about immensely important questions differ widely. The questions are these: does the presence of even moderate fever curves indicate tuberculin? Is a local focal reaction desirable or is a local focal reaction to be avoided? While one observer, for instance Petruschky, considers a local reaction as necessary for the achievement of an effect, a no less authoritative observer (Sahli) advises the prevention of any local reaction. It is not possible to determine before the injection the effect or the intensity of possible local or focal reactions. It occurs often when it is not expected and even after very small doses. A practitioner should always remember the difficulty or impossibility of any prediction. In the experience of authoritative observers the application of too small doses makes the beneficial action an illusion, because then the local reaction is insufficient. With large doses one runs the chance that a too strong reaction follows, which may favor a diffusion of the process and destruction of tissue. How are we to find the golden middle line? As far as my experience goes, precaution can never be great enough. By all means the injections should not be repeated oftener than in a week and should be commenced with not more than 1/1000 mg. The increase of the doses ought to be governed by testing and closely watching the general and local conditions. All these experiences show that just now it is impossible to form exact, firmly founded indications for tuberculin therapy, even in its single features; in other words, we are, so far, in the stage of experimentation.

If then I throw my eyes on the undesirable, uncontrollable side effects of the tuberculin (headache, fever, sleeplessness, rheumatic pains, loss of appetite, rapid pulse, loss of weight, general lassitude, etc.) that sometimes announce an acute exacerbation or complication of the tuberculous process, but frequently also point to an individual hypersensitivity to tuberculin; if I further consider the long duration of the course, and the complicated delicate method of its application, the limited indications and many contraindications; then I must be pardoned if I cannot as yet be enthusiastic about this treatment. My experience and that of many colleagues is my guide in this matter.

MEDICAL AND SURGICAL PROGRESS.

GLYCOSURIA AND ITS RELATION TO PREGNANCY.

A REVIEW OF RECENT LITERATURE.

By HUGO EHRENFEST, M. D.

1. THE CLINICAL SIGNIFICANCE OF GLYCOSURIA IN PREGNANT WOMEN.—J. Whitridge Williams (*Am. Jl. of Med. Sciences*, January, 1909).
2. RAPPORTS DU DIABETE SUCRE ET DE LA PUERPERALITE.—Chapicot (*These.*, Paris, 1907).
3. GLYKOSURIE UND SCHWANGERSCHAFT.—Reichenstein (*Wien. klin. Wochens.*, Okt. 21, 1909).
4. WECHSELBEZIEHUNGEN ZWISCHEN DIABETES UND DEM GENERATIONSPROZESSE.—Offergeld (*Wuerzburger Abhandl.*, Bd. IX., H. 3).
5. GLYKOSURIE BEI FRAUEN.—Henckel (*Deutsche med. Woch.*, November 18, 1909).
6. INTERNE BEHANDLUNG DIABETISCHER FRAUEN IN SCHWANGERSCHAFT GEBURT UND WOCHENBETT.—Offergeld (*Wuerzburger Abh.* Bd. IX., H. 9).

Among recent contributions the paper of Williams (1) most clearly exhibits our present knowledge concerning the significance of sugar in the urine of pregnant women. He differentiates between (a) lactosuria; (b) transient glycosuria; (c) alimentary glycosuria; (d) recurrent glycosuria; and (e) diabetes.

Lactosuria. In 1856 Blot stated that he had been able to demonstrate the presence of sugar in the urine in amounts varying between 1 and 2 grams per liter in 45 women who suckled their children. Moreover, he held that sugar could be found in the urine of about 50 per cent. of women in the last weeks of pregnancy. Unfortunately he designated the condition as "physiologic glycosuria," but did not attempt to determine whether the sugar in question was glucose or lactose. In 1877 and 1879 Hofmeier and Kaltenbach isolated the sugar in question and definitely ascertained that it was lactose, that the condition was one of lactosuria, and that the term glycosuria was a misnomer. To-day we know that the existence of slight degrees of lactosuria (0.5 to 1 gram per liter) in the early days of the puerperium, may be regarded as perfectly physiological, while the presence of larger quantities (10 to 50 grams to the liter) may be expected whenever the breasts become engorged or the child is weaned. During the process of weaning the quantity of sugar may rise as high as

three and four per cent. and persist until the secretion has been checked and the breasts become soft and flabby. By specially delicate tests slight degrees of lactosuria may also be detected during the last weeks of pregnancy and it is usually associated with premature mammary activity.

Transient Glycosuria. Appreciable quantities of glucose may be demonstrated in the urine during the second half of pregnancy and particularly during the last few weeks. In such cases the amount is very small, varying from 1 to 2 or 3 grams to the liter. Exceptionally, the amount of sugar may rise to 3 or 4 per cent. and even give rise to slight symptoms, such as pruritus, increased thirst and frequent urination, although subjective manifestations usually are absent. In either event the glycosuria may disappear spontaneously after a shorter or longer period, or may persist throughout the period of the pregnancy, to disappear definitely after the birth of the child. It is obvious, but unfortunate, that in many of these cases the proper diagnosis can not be made immediately but only after conclusion of the pregnancy. As to the significance of transient glycosuria, it may be said that the milder degrees (1 to 2 grams to the liter) should be regarded as practically physiological, while the occurrence of larger quantities must be considered abnormal, although, as far as our present knowledge goes, not necessarily of clinical significance.

Alimentary Glycosuria. In 1895 Lanz and Jaksch pointed out that women were less tolerant of sugar during pregnancy than at other times, and that transient glycosuria frequently followed the ingestion of an amount of glucose which would have been thoroughly assimilated by a non-pregnant woman. That such an intolerance actually exists, is to-day generally conceded, but, as Williams states, notwithstanding the large amount of work which has been done investigating this subject, we are as yet unable to give a satisfactory explanation of either transient or alimentary glycosuria. This point will be considered fully in another part of this review.

Recurrent Glycosuria. This peculiar type of glycosuria which appears during pregnancy, disappears at birth, and reappears more or less regularly during subsequent pregnancies, has been occasionally recorded. It is obvious that this condition can not be designated as true diabetes. However, it must be regarded as more serious than ordinary transient or alimentary glycosuria, in that it probably indicates the existence of a more profound and continuous disturbance of metabolism.

Diabetes. It is probably due to the fact that only recently careful attempts have been made to differentiate between true diabetes and other forms of glycosuria, that most writers still state that diabetes occurs much more frequently as a complication of pregnancy, than that conception takes place in diabetic women. Often the existence of an old diabetes is first detected when an intervening pregnancy aggravates and makes notable certain symptoms and leads to urinalysis. The histories of 66 definite cases of diabetes, collected by Williams, show that in 55 cases the diabetes was present before the onset of pregnancy. It seems fair to assume that diabetes does exist previous to conception in a much larger proportion of cases than is generally believed. But whether existing primarily, or first appearing during pregnancy, diabetes must be considered a very serious complication of pregnancy. Williams' own statistics show an immediate mortality of 27 per cent., while an additional 23 per cent. died within the following two years. Generally speaking the patients do comparatively well for the first seven or eight months of pregnancy, although they may suffer considerably from pruritus, thirst, ravenous appetite and frequent micturition. Exceptionally coma may

supervene in the latter part of pregnancy. More usually, however, symptoms do not appear until the time of labor, and then the patient may die either in coma or collapse within a few hours after the birth of the child, but even at this time coma is not necessarily fatal. Diabetes also exerts its deleterious effect upon the child. Abortion and premature birth ensue frequently, and even if pregnancy goes on to term it is not unusual for the child to die shortly before the onset of labor, and be borne in a more or less macerated condition. It seems that diabetes frequently predisposes to excessive development of the child which may give rise to serious dystocia. One of the interesting complications associated with this condition is hydramnios, and frequently the amniotic fluid contains sugar.

For diagnostic purposes the first essential is to determine whether the sugar present in the urine is lactose or glucose. This is readily ascertained with sufficient accuracy by the use of the fermentation saccharometer, as glucose ferments readily while lactose does not. It must be borne in mind that both glucose and lactose may occur together, and such a combination should be suspected whenever there is a discrepancy between the readings obtained by filtration with the Fehling solution and by the use of the saccharometer. In cases in which glucose is found the determination of the special type of glycosuria for practical purposes is necessary, but at times can be made only after continued observation. A tentative diagnosis of diabetes is permissible whenever large amounts of glucose are present or the patient exhibits characteristic symptoms. The persistence or disappearance of sugar under dietetic treatment does not necessarily afford accurate information concerning the nature of the condition, as it sometimes happens that cases of glycosuria will be uninfluenced by a carbohydrate-free diet, while, on the other hand, in true diabetes all trace of sugar may disappear temporarily under a plain milk diet.

If diabetes be definitely diagnosed from the previous history, the condition should be regarded as serious but by no means hopeless for either the mother or child. If, however, in the course of pregnancy in spite of careful diet, serious symptoms supervene, acetone bodies appear in the urine, or the output of sugar cannot be controlled, the condition should be considered as alarming and the pregnancy should be ended at once by the most appropriate means, as its continuance will add to the dangers of the mother, while the child's prospects are so poor that they are not entitled to consideration. But it always must be borne in mind that in the vast majority of cases the presence of sugar in the urine is not indicative of diabetes, but merely of transient alimentary glycosuria, and the latter diagnosis should be made tentatively whenever the amount of glucose does not exceed 2 or 3 per cent. and symptoms are absent or only slightly marked.

It may be stated here that Chapicot (2) goes so far as to emphasize that pregnancy never produces a diabetes, but only will aggravate the disease when existing at the time of impregnation.

Reichenstein (3) also is inclined to believe that pregnancy does not play any role in the etiology of diabetes. He comes to this conclusion as the result of very careful investigations made on pregnant women concerning their assimilation power of sugar. He found most pronounced changes in the metabolism of the carbohydrates. The tolerance against sugar is markedly reduced; indeed, he succeeded at times in producing a glycosuria by feeding starches and observed alimentary levulosuria, but "in spite of this serious affection during pregnancy of those organs

which regulate the metabolism of the carbohydrates," he writes, "we cannot assume that this disturbance is irreparable or predisposes to the development of true diabetes mellitus. If this were true, approximately 10 per cent. of all parous women would suffer from diabetes."

Williams, in his very careful search of the literature since 1874, was able to collect only 66 authentic cases of complication of pregnancy with true diabetes. A small number indeed, but this seems not surprising in view of our knowledge concerning the effect of diabetes upon the female generative organs. This relation is interestingly considered in a monograph of Offergeld (4). Women suffering from diabetes very rarely become pregnant. This fact is well known and has been variously explained by the many authorities who have investigated the problem. Nervous influences, upon the uterus, neurotrophic changes in the genital nerves, have been assumed; but distinct pathologic changes in the ovarian tissue of a necrotic or inflammatory nature, sclerotic changes of ovarian vessels, secondary atrophy of the uterus, a peculiar endometritis, have often been found in women dying from diabetes. Offergeld describes in detail the influence of diabetes upon the course of pregnancy, labor and the puerperium and its effect upon the fetus. We refrain from quoting him here in extenso, because his deductions to a large extent are based upon the same statistics as those used by Williams.

While most modern writers agree concerning the existence during pregnancy of a decreased ability to assimilate sugar, there still is great difference of opinion as regards the cause of this impairment. Reichenstein closes the article already quoted with the following sentence: "This condition, when remaining within physiologic limits, must be regarded as the effect of an influence exerted during pregnancy by the ovaries (according to Fellner, by the uterus) upon those other glands with internal secretion which control the metabolism of the carbohydrates, *i. e.*, liver, pancreas, thyroid, adrenals, etc."

Henckel (5) acknowledges the uncertainty still prevailing concerning the actual cause of that peculiar glycosuria frequently appearing during pregnancy, but is inclined to believe that, at least in a number of instances, the condition is due to the effect of toxins upon liver, pancreas or, possibly, upon the sympathetic nerves. He bases his theory of the toxic origin of the glycosuria largely upon the not uncommon, and, in his belief, not properly appreciated, concurrence of glycosuria with gynecologic diseases, especially new growths. The prompt disappearance of the sugar from the urine after extirpation of the tumor speaks in favor of a theory that toxic substances originating in these growths are responsible for the disturbances of metabolism, and Henckel suggests the possibility that these toxins primarily affect the sympathetic system.

A question of eminent practical importance is carefully considered in another monograph of Offergeld (6) entitled: *The Internal Treatment of Diabetic Women During Pregnancy, Labor and the Puerperium*. Whenever a woman belonging to a family of diabetics becomes pregnant, her urine should be examined repeatedly and in view of that reduced tolerance against carbohydrates existing during pregnancy, as a matter of simple precaution, a surplus of fats and carbohydrates should be carefully avoided in her diet, and in their place proteids should be given and such filling food as vegetables, potatoes and fresh fruits. If the presence of true diabetes is detected in the course of a pregnancy, first of all in the usual way an attempt must be made to ascertain, at least approximately, the patient's tolerance for the carbohydrates. Two great obstacles at once manifest themselves. It will be extremely difficult to

remove completely the sugar from the urine; first, because the fetal demand for an ample supply of nutritive material must be taken into account, and, second, because the disease during pregnancy, almost without exception, gradually becomes more serious, and as pregnancy advances the patient's tolerance for sugar gradually is reduced. At a time when the tolerance still seems rather satisfactory the subjective symptoms assume the character of those symptoms usually seen only in serious cases of diabetes. The patients complain of complete lack of appetite; in other instances of inability to satisfy their ravenous hunger; they feel weak, lose in weight, suffer from thirst, from insomnia, often are tormented by a pruritus, and void enormous quantities of urine. Soon, also, objectively the turn for the worse can be ascertained in the rapid increase of sugar in the urine. The treatment, in view of our present ignorance concerning the etiology of diabetes, is solely dietetic. According to Naunyn the dietary of the diabetic patient should be calculated on the basis of an approximate requirement of 2500 heat units. Offergeld proves that the requirement for the pregnant woman is considerably higher. He figures for the beginning of pregnancy the necessity of additional food representing approximately 50 heat units per day; this demand gradually increasing to 200 units at the normal end of pregnancy. It seems obvious that for the purpose of exact feeding alone, if not for other reasons, the diabetic pregnant woman should preferably be kept in a hospital. Offergeld believes that gymnastic exercises, which so often exert a favorable influence in cases of glycosuria, are especially desirable in the treatment of diabetes during pregnancy, and that for this purpose the recent idea of early rising after labor seems very suitable for diabetic puerperæ. No special methods of treatment of diabetic coma during pregnancy can be suggested; all cases so far recorded have ended fatally. Coma, as a rule, appears during labor, often quite unexpectedly, and probably the physical exertion and psychic emotion of labor are the main factors responsible for the sudden serious turn. It must be the aim of the obstetrician to shorten labor, possibly by means of instruments, and to relieve pain by the use of morphine and scopolamine. During and after the third stage of labor, all unnecessary loss of blood must be carefully avoided. Diabetic puerperæ are not permitted to nurse their children, and during the lying-in state must be carefully protected against colds in view of their known susceptibility for acute infections with tuberculosis. The children, usually born in a weak condition, are deprived of the benefit of mother's milk. Their mortality is very high. If nourished artificially, the carbohydrates should be used with discretion but a really fair chance to survive is given to them only when supplied with milk from a wet-nurse.

DUODENAL ULCERS.

A REVIEW OF RECENT LITERATURE.

By JESSE S. MYER, M. D.

1. EXPERIMENTELLER BEITRAG ZUR PATHOGENESE DES ULCER ROTUNDUM DES MAGENS.—Guiseppe Zironi (*Archiv für Klinische Chirurgie*, B. 98. H. 3. Page 662).
2. SURGERY OF THE STOMACH.—Deaver (*Boston Med. & Surg. Jl.*, CLXI., No. X.).
3. ON THE IMPORTANCE OF DISTINGUISHING SIMPLE ROUND ULCERS OF THE DUODENUM FROM ULCERS WHICH INVOLVE THE PYLORUS OR ARE ABOVE IT.—Codman (*Boston Med. & Surg. Jl.*, Vol. CLXL., Nos. 10, 11 and 12).
4. THE DIAGNOSIS OF ULCER OF THE DUODENUM.—Codman (*Boston Med. & Surg. Jl.*, Vol. CLXI., Nos. 22, 23, 24 and 25).
5. A PRACTICAL METHOD OF OBTAINING THE DUODENAL CONTENTS IN MAN.—Max Einhorn (*Medical Record*, Vol. 77, No. 3, page 98).
6. A NEW METHOD OF RECOGNIZING ULCERS OF THE UPPER DIGESTIVE TRACT.—Max Einhorn (*Medical Record*, 1909. Page 549).

Little of importance has been written in recent months regarding gastric ulcers. The work has all tended to emphasize the ever increasing proportion of duodenal ulcers, and the diminution in the pure gastric type. Zironi, in a very recent report, claims to have been able to produce gastric ulcers in the rabbit by a subdiaphragmatic vagusresection. The picture resembles, both macro- and microscopically, those found in the human. The ulcers were produced in 63 per cent. of his operated animals and showed in only a very few cases a tendency to heal. Artificially produced anemia always hastened the development. Deaver believes the gastric ulcers are autoinfectious in origin, and that the hyperacidity so often found is due to the presence of the ulcer rather than vice versa.

The most original and striking statements regarding duodenal ulcer are those presented in two recent papers by Codman. He claims to find duodenal ulcers, including the acute perforating and chronic types, as frequent as acute appendicitis and fully twice as common as gastric ulcers. In his last 100 cases he found one in sixteen due to a perforating duodenal ulcer. Many cases of perforating ulcer are overlooked, and treated as a perforating appendicitis even after the abdomen has been opened; the appendix usually being markedly injected, frequently covered with a fibrous exudate as a part of the general peritonitis. Furthermore many cases of so-called perforating gastric ulcer are really duodenal, and have not been recognized as such on account of the lack of careful observation by the surgeon. The best proof of this is the marked increase of duodenal ulcers since Mayo has given us a simple method of orientation. Only a small percentage of duodenal ulcers perforate,—not more than one in forty.

Codman compares the ulcer in its relation to the pylorus, to the action of the rectal sphincter in cases of fissures. When the pylorus contracts the mucous surfaces cover and protect the raw surfaces, while when the sphincter relaxes it permits the acid food to come in direct contact with the ulcer. This explains the late pain in this type of ulcer, and also the beneficial effect of alkalies. These protect the ulcer by controlling the sphincter action rather than by reducing the acidity. The bile and pancreatic juices are no doubt just as irritating to the raw surfaces as is the hydrochloric acid of the stomach, a point of value in considering the treatment of this type.

The duodenal ulcers always tend to extend toward the stomach, and thus tend to involve the pyloric sphincter. Codman thinks the symptoms of ulcers must be divided into three groups, those in which the ulcer is situated entirely below the pylorus and does not interfere with its function, secondly those involving the pyloric sphincter and lastly those situated above the pylorus and not interfering with its function. In the pure type of duodenal ulcer a long history of illness is present. They occur in the young and very active individuals, the lazy being immune according to Codman. Pain, severe though bearable, and coming on just when the stomach is becoming empty (hunger pain) is the most constant symptom and has the same relative importance as rigidity in appendicitis. After a time when the ulcer has reached the pylorus, we get acute exacerbations due to the transitory inflammatory involvement of the sphincter. We now get the acute attacks with constant pain, epigastric tenderness and vomiting. This passes off after a time and the patient again is free, except for his daily painful dyspepsia. Hemorrhage is a complication rather than a symptom. If hemorrhage occurs at all in duodenal ulcers, and this will depend upon the relation of the ulcer to the larger blood vessels of the duodenum, it will at some time be severe. This, of course, clinches the diagnosis. The same may be said regarding perforation. The symptoms which accompany a perforation will depend upon its location; general peritonitis, local abscess, etc. Duodenal ulcers may and do heal, and without the leaving of a scar which can be recognized, except in those involving the muscular layer where connective tissue replaces the muscle tissue. The mucous membrane is replaced without the slightest trace of the old process. This explains the false statistics which the autopsy records have given to date.

Codman regards the treatment of duodenal ulcers as surgical. Resection of the ulcer appeals to him as the most rational treatment. He cannot satisfy himself theoretically, how a gastro-enterostomy can cure a duodenal ulcer, when it continues to leave the ulcers exposed to the bile and pancreatic juices. Against his theoretical objections he quotes the good results of the Mayo's with 82 per cent. cures by simple no-loop gastro-enterostomy. Codman cannot see the rationale of the usual medicinal and dietetic treatment in the cases of duodenal ulcers, except at the time of acute exacerbations due to the transitory pyloric involvement. Frequent feeding is necessary to relieve the pain and liquid nourishment is not necessary in that by the time the stomach contents reaches the duodenum it is liquid anyway. Rectal feeding could be of benefit only if it can be shown that it decreases the secretion of bile and pancreatic juices.

Einhorn has given up the use of the duodenal bucket as impractical, and has now devised another means of obtaining duodenal contents for examination. He has attached a small perforated metal capsule to a small thin rubber tube. The patient swallows the tube with the capsule attached, and after waiting about an hour, the contents is aspirated. In

most cases he claims this will bring up the duodenal secretion, which can be recognized by its reaction and golden yellow color. In cases of pyloric stenosis it has not been possible to reach the duodenum.

Einhorn has also reported excellent result by the use of his duodenal thread which the patient is permitted to swallow, and is left in position from twelve to twenty-four hours. In duodenal ulcer he claims to find a reddish brown stain at the point of contact with the ulcer. As yet his results have not been substantiated by others, and the value of this device is still in doubt.

PATHOLOGY OF SYPHILIS OF THE NERVOUS SYSTEM.

A REVIEW OF RECENT LITERATURE.

By SIDNEY I. SCHWAB, M. D.

The Pathology of Syphilis of the Nervous System in the Light of Modern Research.—F. W. Mott, F. R. S. (The Morison Lectures).

These three lectures were delivered at the Royal College of Physicians at Edinburgh and may be taken as the opinions and conclusions of perhaps the foremost investigator in England on the pathology of the nervous system. It can be assumed that, as far as present research goes, the ideas contained in these lectures are the fruit of careful investigation supported by clinical research of the most exacting kind. Therefore, for the present, the Morison lectures of 1909 might be taken as the best opinion on the subject of syphilis of the nervous system. In considering the general pathology of syphilis of the nervous system Mott does not think it necessary to refer to the different bacterial and other organisms which have been described by various authorities as being specific in the production of the lesions characteristic of this disease. The etiological significance of the spirochæte *pallida* of Schaudin is admitted, and it is assumed that this is the active cause of syphilis. The proof of this is based chiefly upon three sets of facts: First, the discovery of the organism in lesions of syphilis; second, the transmission of syphilis from man to apes and the demonstration of the organism in the blood of the latter; and third, the specific reaction of the spinal fluid of syphilitics by Wassermann, Neisser and Bruck. Syphilis is taken to be an eruptive malady following the inoculation of the virus, presumably the spirochæte of Schaudin and characterized by the possibility during the remainder of the life of the individual of fresh eruptions occurring in connection with the existence of the virus in the body. Microscopical examination shows that essentially the same tissue reactions are present in these late manifestations of syphilis as in the primary or secondary stages.

It is well known that tertiary lesions are as a rule non-infective. Consequently we should not expect to find the productive agent except in a few instances, and then only in small numbers. This is actually what occurred. The unusual perivascular infiltration of lymphocytes and plasma cells in the nervous system was held by Nissl and Alzheimer to be pathognomonic of general paralysis and tabo-paralysis. Mott has shown that exactly the same thing occurs in sleeping sickness. In all chronic trypanosome infections such as sleeping sickness and dourine Mott found a marked hyperplasia of neuroglia. Thus it is seen that the lesions of syphilis and trypanosome infections have practically the same tissue reactions. This fact, first brought to notice by Mott, is in support of the theory that Schaudin's organism is the true cause of syphilis.

The following hypotheses may be brought forward to explain the phenomena of a gumma appearing spontaneously in the nervous system

long after the primary sore, and an apparent cure of the disease has taken place.

1. The spirochæte, or some modified form of it, has remained latent in the tissues at the seat of the lesion and, for some reason, inherent or otherwise, the resistance of the tissues at that particular spot has become lowered, and the organism has exerted again its specific activity—possibly in some not yet discovered intracellular form.

2. The specific organism has remained latent in some other tissue, *e. g.*, the marrow of the bone, the spleen or glands, and, escaping into the blood or lymph circulation, has, like a new growth, engendered a metastasis, which has developed and increased, producing hyperplasia of the fixed tissue cell elements, conjunctival and endothelial.

3. There are many varieties of specific spirochætes, one of which may have an elective affinity for the central nervous system, as we know the trypanosoma gambiense has. It is difficult to differentiate this trypanosome from other forms of morphological appearances; how much more difficult would it be to differentiate varieties of spirochæte pallida.

4. The invasion of the body by the spirochætes has altered the blood and lymph biochemically, so that the tissue reactions to all causes which would lead to injury may take on the specific character.

Attention is called to the modern researches bearing upon the biochemical changes which occur in tissues and fluids of the body as the result of the entry and persistence of the syphilitic virus in the body. There seems to be a good deal of truth in the opinion of Bang that the importance of protein as carriers of life has been over-estimated, while that of lipoids has been neglected. The name "lipoid" was given by Overton to fat-like substances which are contained in the cells of living things,—animals and vegetables. They were named by Waldemar Koch, lecithins, but this name has not been adopted. These lipoids were, until recently, considered of little importance. In fact one of them, cholesterin, was looked upon merely as a physiological curiosity until Flexner and Noguchi's experiments on cobra venom had been published. The substance in the serum producing hemolysis was identified by Keys as lecithin. A lipid substance in great abundance, then means cell dissolution; the nucleus highly charged with phosphorus and the cell protoplasm break up into a lipid complex as a result of the nucleolysis and plasmolysis. It may be suggested that Levaditi's experiments show that the spirochætes stimulate the fixed tissue cells to proliferate, and then, invading this bed of young cells rich in nuclein, they, by the action of some secretion or otherwise, cause these same embryonic cells to undergo lysis, thus providing the necessary pabulum for their own growth and proliferation. It is probable these young cells are more easily attacked than the older cells, and this may be the reason that the spirochætes are found in such great abundance in fetal tissues, and why the fetal tissues, especially the liver, contains such an abundance of lipid substance serving for the Wassermann reaction, although chemically it does not differ from lipid substance which can be obtained from normal tissue.

With the understanding of the importance of lipoids, the Wassermann serum reaction and other methods dependent upon biochemical changes produced in the body by an introduction of the syphilitic virus, may be better understood. In the hands of nearly all trustworthy and experienced investigators this method introduced by Wassermann has yielded most valuable results as a means of diagnosis. It is claimed even that it is more reliable than the Widal reaction for typhoid. Plaut obtained a positive reaction in 80 to 90 per cent. of undoubted cases of syphilis by

this method. Mott gives his own results in the examination of the cerebro-spinal fluid of 100 cases; 46 cases of general paralysis were examined, 41 of which gave a positive reaction by the Wassermann test, a percentage of 89.1 per cent.

The original method of Wassermann is the most complicated, but is regarded by the majority of investigators as the most specific and reliable. Whatever may be the explanation of the facts, all the evidence goes to prove: (1) That these methods in the hands of competent observers afford a valuable means of diagnosis and are especially useful when applied to the cerebro-spinal fluid for the determination of the existence or not of general paralysis. (2) That similar substances, whether antibodies or not, occur in the serum of syphilitic and parasyphilitic persons in such quantities as are not found in the serum of normal persons or in the sera of people suffering with other diseases. (3) That similar substances are found in the cerebro-spinal fluid of tabetics and general paralytics, and the amount of those substances which cause a deviation of the complement or a precipitation is in proportion to the activity and length of duration of the disease; that these substances are of tissue origin or arise from tissue destruction caused in some way by the action, present or past, of the syphilitic virus. (4) It is probable that the syphilitic virus excites an increased unloosening of complex lipid substances containing lecithin and cholestrin, etc., from the red corpuscles and cells of the body. (5) This prevails through life; and in certain cases of syphilitic infections, viz., general paralysis and tabes, the central nervous system, which under ordinary circumstances is protected against the loss of its lipid substances, takes part in the process, and this is manifested by the presence of lipoids and globulins in the cerebro-spinal fluid, and these act as antidotes in the reaction. This lipid complex, as well as globulin, increases in amount as the process of neuronie decay proceeds. It is probably owing to the presence of these substances that the granulation of the ventricles, so characteristic a feature of general paralysis, arises as a result of stimulation to proliferative hyperplasia of the ependymal epithelium. Choline may also be present owing to the decomposition of lecithin, but this may occur in any active degenerative process of the myelin, and is not pathognomonic of any particular disease.

In the last lecture Mott attempts to correlate the facts of biological and biochemical investigation with clinical anatomical knowledge, especially in the relation of the etiology of the parasyphilitic infections,—tabes and general paralysis. Parasyphilis is the term given by Fournier to those diseases of which syphilis is essentially the cause, but which are not directly the result of the syphilitic virus. Such diseases are general paralysis, tabes dorsalis, tabo-paralysis and primary optic atrophy. These diseases are really a single morbid entity owning the same cause, insidious in onset, progressive in character, and uninfluenced by anti-syphilitic remedies. These various clinical types of parasyphilitic diseases are the result of a primary neuronie dystrophy and may occur simultaneously or successively in the same individual. In tabes dorsalis the spinal sensory protoneurons are affected; in general paralysis the cortical association neurons; in tabo-paralysis both are affected simultaneously or successively. The dystrophic process is due to a lack of durability of the neurons; it may be a slow process of decay and death of the intraspinal portion of the sensory protoneurons, as in the case of tabes dorsalis; it may be a rapid process of decay and death of systems and communities of neurons of the brain, as in general paralysis.

The former is a smouldering destruction of neural elements; the latter a conflagration often fanned into flames by microbial toxemia, auto-toxemia, or circulatory disturbances associated with arterial anemia and venous congestion with blood stasis of the brain. It is probable that Erb's spinal paralysis and certain cases of amyotrophic lateral sclerosis may be primary post-syphilitic, dystrophies. The numerous clinical pictures of hereditary syphilis may be due: first, to the direct influence of the virus upon the life and the growth of the tissues, or indirectly to exhaustion of the specific energy of the cells of the central nervous system by the establishment of an altered metabolism.

Mott provisionally suggests as a hypothesis that in all cases of acquired and congenital syphilis the living contagium (spirochæte) excites the tissues and fluids of the body to a defensive reaction. The difference in the effects of inoculation may depend upon the virus itself. Some striking examples can be given which apparently indicate that there may be a special neurotoxic virus, and if such instances were more numerous it could hardly be believed that coincidence could explain the facts. If, as there is reason to believe, that the spirochæte pallida is the living contagium, and that, becoming generalized in the lymph and blood stream, it produces the secondary manifestations, then there is a certain amount of chance as to what tissues will be attacked; for the living agent, swept along in the blood stream, may become lodged anywhere, and, by blocking capillaries, cause a local focus for tissue infection. The existence of a generalized eruption implies virulence of the circulating blood, and experiments demonstrate the fact that the blood is virulent during the eruptive stage.

Fournier states: "The comparative mildness of the primary constitutional symptoms in those who ultimately become tabetic would almost seem to indicate that, when the syphilitic virus expends itself in severe primary and secondary manifestations, there is a less tendency to the subtle poison which proves so disastrous to the nervous system." From an experience of over 500 post-mortems made on paralytic patients, Mott has been surprised at the rarity of severe tertiary skin and visceral lesions as compared with the cases of true syphilitic brain diseases. Arterio sclerosis, in the form of fibrotic plaques of the aorta, is, however, very common in paralytic dementia which is now regarded as a parasymphilitic infection. All the facts go to prove that the syphilitic virus has, in some way or other, damaged the durability of the neurons so that system or communities die prematurely.

The Wassermann method of diagnosis has come to strengthen and confirm the belief of many neurologists in the dictum, "No syphilis, no tabes." Although syphilis is the essential cause of tabes and general paralysis, Fournier has shown that they are not syphilitic but that they are an outcome of syphilis, and the riddle is still unsolved why only about from 3 to 5 per cent. of persons infected with syphilis subsequently suffer with this disease of the nervous system, termed parasymphilis. But only 10 to 15 per cent. suffering from diphtheria developed post-diphtheric paralysis and these are usually cases in which a local process was mild and often unnoticed, in that respect, like parasymphilitic infection, which more often than not, follow mild and even unrecognized primary infections and secondary symptoms. Is it because the virus is attenuated or modified and thereby has acquired a special neurotoxic action? or, is it because in a small percentage of individuals the cells of the body, especially the cells of the nervous system, react to the virus in a hypersensitive manner? As already indicated, there are facts which

suggest the possibility of a certain form of virus with neurotoxic action. If we accept the fact that spirochæte is the specific causal agent of syphilis, it is conceivable that there may be varieties of this organism as there are of the malarial paracytes, trypanosome.

After pointing out various theories to the protection of the body exercise against syphilitic infection, Mott calls attention to the important role of the lipid destructive process of the central nervous system and brings out in a positive manner the increase in lipid substances in the blood of tabetics and general paralytics. He concludes from these observations that anti-syphilitic treatment in cases of metasyphilitics is directly counterindicated as they tend to reduce the very defenses of the nervous structures which are needed for protection. The only hope of doing any good, according to him, is by an early diagnosis of the disease and the suppression of all those exciting causes which use up the nervous energy and tend to overturn the normal metabolic equilibrium of the nervous structures. Mott concludes in his last lecture by hoping that the words of the old philosopher may come true: "That one thing after another will grow clear, and dark night will not rob you of your road, to keep you from surveying the utmost things of nature; in such wise things will light the torch for other things."

UNCINARIASIS.

A REVIEW OF RECENT LITERATURE.

By ALBERT E. TAUSSIG, M. D.

1. Alvarez (*Jl. Am. Med. Ass.*, May 1, 1909).
2. Bagby (*Jl. Am. Med. Ass.*, January 26, 1907).
3. Bass (*Arch. Int. Med.*, March, 1909).
4. Chamberlain (*Arch. Int. Med.*, July 15, 1909).
5. Report of the Hookworm Conference in Atlanta (*Jl. Am. Med. Ass.*, January 29, February 5, 12, 19, 1910).
6. Pepper (*Jl. Med. Research*, March, 1908).
7. Stiles (*Osler's Modern Medicine*, Vol. I.).
(Public Health and Marine Hosp. Bull. No. 10.)
8. Telemann (*Deutsch. Med. Wochenschr.*, August 27, 1908).
9. Whipple (*Am. Jl. Med. Sc.*, July, 1909).

The work of Stiles and others during the last few years has brought home not only to the medical profession, but to the public at large, the great economic and social importance of hookworm disease in the South. The statistics in regard to its prevalence would be incredible if they were not based on careful observation on the part of competent men. Thus both Harris and Stiles state that uncinariasis is the most common of all the infectious diseases of the southern states. One out of every eight of the cotton mill employees of the southern states, if we accept the 130 mills examined by Dr. Stiles as a basis, has hookworm disease so far advanced that the diagnosis can be made by inspection of the patient. In the sand-land mills the infection among the employees runs up to as high as 50, 60 or nearly 70 per cent. and in many of the more isolated farming regions the prevalence of the disease seems hardly less. Dr. Stiles considers it an understatement to say that over 2,000,000 of our southern people are infected with the hookworm.

The economic loss involved in this condition is readily apparent. Since the typical hookworm patient is lazy, indifferent and incompetent, this disease alone may well be held accountable for the traditional backwardness of many parts of the South. The children of the poor, who are especially subject to the infection, not only grow up into physically stunted men and women, but are intellectually so handicapped as to be incapable of taking advantage of even the limited educational opportunities offered them. Throughout the sandy and piney regions of the South, it has been found that laggards among the school children are, almost without exception, harborers of the hookworm.

History.—That uncinariasis is by no means a modern disease is shown by a passage in the Ebers papyrus, a manuscript written in Egypt some 1500 years before Christ. In it, according to Sandwith, a disease called AAA or UHA is described that is evidently identical with what we know as uncinariasis. Its symptoms are accurately recounted and a remedy is prescribed for "worms produced by AAA disease." Thereafter the disease

seems not to have been recognized until the Brazilian physicians met and described it in the seventeenth century. The parasite responsible for the disease was first described by Dubini of Milan in 1843. Thereafter cases were reported from various localities in Europe and Asia and a serious outbreak occurred during the excavation of the St. Gotthard tunnel.

The credit for discovering the first case in the United States belongs to the late Dr. Blickhahn, then assistant superintendent in the St. Louis City Hospital. The writer was at that time (1893) a medical student attending clinics at the City Hospital and he well remembers the excitement occasioned by that astonishing discovery. The patient was a German brickmaker and the infection apparently an imported one. Some years later Stiles announced the discovery of the parasite responsible for American uncinariasis. It differed in important respects from the European species and was called by him *uncinator americanus*, the American slayer. Stiles's famous voyage of discovery throughout the southern states first brought home to American physicians the terrible prevalence of this infection and laid the foundation for our present knowledge of its distribution and importance.

The Parasites.—The American hookworm differs in a number of minor features from the European ancylostoma, chiefly in the conformation of its mouth. It is about one-third of an inch long and looks like a very fine white thread. It inhabits the small intestine, especially the jejunum and ileum, but also the duodenum and has been found in the stomach. The worms do not multiply in the intestines, so that each parasite present there must have entered the host from without. "The eggs are oviposited in the intestine of the patient; they do not develop until they escape with the feces; then they develop within twenty-four hours or more, according to conditions of heat, moisture and oxygen, a rhabditiform embryo which undergoes ecdysis (shedding of skin) after about forty-eight to seventy-two hours; a second ecdysis which occurs within about five to nine days changes the worm to the infecting stage—the so-called 'encysted larvæ'; from this point the worm takes no more food until it reaches man." Infection was formerly supposed to take place through the mouth either by means of the drinking water or by the contamination of food by dirty hands. This method is now known to be unusual if it occurs at all. The chief and perhaps the only port of entry seems to be the skin. Looss's experiments have shown "that the hookworm larvæ may pass through the skin, reach the circulatory system, pass with the blood through the heart to the lungs, from the lungs to the air passages, up to the larynx, down the esophagus to the stomach and then to the small intestine." Astonishing as this theory may seem it has been fully confirmed by the observations of others. Bentley's experiments are of especial interest. He infected two specimens of soil, the one with normal feces, the other with stool containing hookworm larvæ. Half of each mixture was kept moist, the other half gently dried. Each of the four specimens was moistened and applied to the wrist of a volunteer subject for eight or nine hours. With three of the mixtures nothing happened. The soil which had been infected with hookworm and had been kept moist, soon, however, occasioned an intense itching. An erythema appeared followed by a minute papular eruption; after twenty-four hours vesicles appeared which changed into pustules presenting the typical pictures of ground-itch, a dermatitis which is very prevalent upon the feet of those who habitually go bare foot in the hookworm regions. The infected soil which previous to the experiment had fairly swarmed with hookworm larvæ was found

absolutely free from them when it was removed from the wrist of the subject. Every one of the worms had apparently penetrated the skin. After the expiration of a considerable interval of time, hookworm eggs were found in the stool of the subject. Bentley concluded that ground-itch was due to the introduction of pyogenic bacteria by means of hookworm larvæ and that this common cutaneous affection is the usual if not invariable accompaniment of hookworm infection. This view has been confirmed by many observers in our South who obtained a history of ground-itch from the great majority of their hookworm patients.

Symptomatology.—The symptomatology of this disease is so various and complex that it can only be briefly indicated here. The skin is sallow or pale and dyspeptic symptoms of greater or less severity are common. The muscles are soft and flabby, the patient is weak and dull so that mental and physical laziness results. There is dyspnoea on exertion, palpitation and dizziness. Dropsy may occur. A greatly distended abdomen is typical of advanced cases. Impotence among men and amenorrhœa among women often occurs. When the women become pregnant, they often abort. The mental torpor may be converted into a variety of psychoses. In advanced cases the patient's pallor may suggest pernicious anemia, but a blood examination shows a hemoglobin deficit greater than that of the red corpuscles with an increase in the percentage of the eosinophils. The feces may or may not contain occult blood but always contain hookworm eggs, which are readily found microscopically and make the diagnosis of this affection relatively easy.

A curious feature of the disease is the fact that while hookworm patients may present the picture of a severe and even fatal illness, many individuals may harbor great numbers of the parasites and yet remain in perfect health. This is especially the case among negroes. The latter seem to have acquired an immunity against the results of the infection, an observation which lends color to the theory that the disease was originally imported into this country from Africa in the slave ships. The writer remembers an interesting observation made while he was a student in Berlin. There was at that time a colonial exhibition there to which a considerable number of negroes had been brought from Germany's African possessions. They were, all of them, fine strapping fellows, apparently in the best of health. An examination of their stools, however, showed that every one without exception was infected with hookworm, many of them in addition harboring bothriocephalus, various taenias and other parasites. Chamberlain found a similar condition among white soldiers stationed in the South. Of 100 men examined, 60 per cent. showed uncinariasis. Practically all of these men were apparently in good health, though most of them reported that they felt more vigorous after treatment. In various southern colleges routine examinations of the students showed 30 per cent. or more suffering from hookworm with practically no symptoms. In one Texas school the percentage of infected students was found so high that the investigation was ordered discontinued by the authorities for fear of injuring the reputation of the school. The significance of these observations is clear. These hookworm carriers, like the typhoid carriers, while well are a menace to the community in which they live, and no campaign against this plague can be effective that does not take them into account.

Diagnosis.—In severe cases, the diagnosis can be made on inspection by any one familiar with the disease. The sallow complexion, the mental and physical hebetude, the protuberant abdomen are very suggestive, if they occur in an infected region. Usually, however, a definite diagnosis

can only be made by an examination of the feces. For country practitioners who have no microscope, the blotting paper test has been suggested. An ounce or so of the feces is folded in the paper, allowed to stand for several hours and the stain on the paper examined by any of the usual tests for occult blood. A positive test is suggestive of hookworm but not conclusive, since blood may be absent in uncinariasis and obviously may be present in other conditions. The only satisfactory and conclusive criterion is the microscopic demonstration of hookworm eggs in the feces. These may be found in every case and if plentiful the examination of a bit of stool, taken at random, may suffice. Often, however, the eggs are so scanty that a prolonged search is necessary and various more or less satisfactory methods for concentrating the eggs have been suggested. Telemann mixes a small piece of feces with equal parts of ether and hydrochloric acid and centrifuges after passing through a fine sieve. This disintegrates most of the small food fragments and makes the eggs clearly visible but does not concentrate very much. Moreover the acid is disagreeable to handle. Bagby rubs up a teaspoonful of feces in a pint of water, strains through gauze and allows the mixture to settle for five minutes. The sediment is stirred up with a pint of water several times, being allowed to settle five minutes each time before the wash water is decanted. A little of the sediment is then taken up by a pipette, which is held point down for a minute until the eggs settle. The first drop is then rich in eggs if the stool was from a hookworm patient. This is an effective method of concentration but suffers from the disadvantage of also concentrating the smaller food fragments as well as intestinal sand, if present. Pepper's method depends upon the observation that the ova are sticky and adhere to the slide. He concentrates with the centrifuge, washing six times. A few drops of the sediment are placed on a slide and are allowed to remain there for a moment, whereupon the slide is inclined and the fluid poured off. The ova alone remain. Alvarez has obtained the best results by concentrating with Bagby's method and then using Pepper's method for freeing the residue from extrinsic matter. Recently Bass has advised a method which he considers better than any other. "A quantity of feces is well diluted with water, 1 in 10, and strained through gauze to get rid of coarse particles. This is centrifugalized, the fluid poured off, the centrifuge tube refilled and centrifugalized again until all the diluted feces have been used. The precipitate is rewashed several times with water as long as anything can be washed out. To know just how long to continue the centrifugalization is the secret of success. One must learn just what is the proper time for his centrifuge. It should be carried out at high speed and just long enough to throw the eggs to the bottom. Too long centrifugalization defeats the purpose. With a centrifuge running 3,500 revolutions a minute, ten seconds at first, when there is much matter, and then four to five seconds is usually the proper time. The centrifuge must be steady. This gets rid of most of the very small things, those having flat rough surfaces and those having a specific gravity about that of water. Now the precipitate should be centrifugated with a calcium chlorid solution of a specific gravity up to 1050. This disposes of everything having a specific gravity below 1050 and the precipitate may now be examined. There frequently remains a considerable amount of material, much of which is appreciably heavier than the eggs and of such a character that it interferes much with their recognition. This material may be removed by centrifugalizing with a solution sufficiently heavier than the eggs. A solution with a specific gravity of 1,250 is very satisfactory. In such a

solution the eggs go to the top. With an appropriate pipette one may remove a few drops from the surface and examine, or, what is still better, pour off some of the top fluid containing eggs, dilute with water sufficiently to bring the specific gravity below 1050, and centrifugate again. The precipitate will now contain most of the eggs contained in the original amount of feces and may all be put on one slide and examined. One such slide contains as many eggs as could be found in several hundred ordinary slide preparations of feces." Finally, if these methods seem too complex or if the physician has no microscope, an appropriate vermifuge may be administered and the stools searched macroscopically for the worms. If present in large numbers, they can usually be found readily. The stool is stirred up with a large quantity of water and examined against a dark background. The hookworms appear as minute white threads.

Treatment.—The treatment is simple and nearly always successful. The diagnosis having been established, the patient is given a brisk purge of calomel or salts. Castor oil should not be used. Early next morning the patient is given thymol in capsules. The size of the dose depends upon the age and condition of the patient. The Porto Rican commission, on the basis of an extensive experience, advises the following dosage: Children under five years, 0.5 gram; between five and ten years, 1 gram; between ten and fifteen years, 2 grams; between fifteen and twenty years, 3 grams; between twenty and sixty years, 4 grams; above sixty years, 2 or 3 grams. The medication may be followed by another purge and should be repeated once a week until the patient is cured.

Ordinarily thymol is an inoffensive drug, but in debilitated cases it may, as the writer can testify, set up a distressing entero-colitis. Such patients may be given beta-naphthol in doses half as large as those of thymol. Male fern may be used but is inferior to either of the above drugs.

The infection itself having been eradicated, the resulting anemia requires treatment. Good food and proper hygiene are of course important. Iron must be given and here the experience of the Porto Rican commission in regard to the superiority of Bland's mass and other inorganic forms of iron over the much vaunted proprietary preparations should be taken to heart.

Prevention.—While the immediate task set the physician in the presence of the patient is the diagnosis and cure of the individual case, the great task that confronts the medical profession of the South in regard to hookworm infection is its prevention. Theoretically this is a simple matter and presents two aspects. So far as possible all cases should be cured whether obviously ill or apparently well and so cease to form a source of infection for their fellows. But even though this is at present impossible, no fresh cases could occur if all infected individuals could be persuaded to use well protected privies instead of contaminating the soil. Practically, however, this is a matter of huge difficulty. Throughout the South, the negroes and the "poor whites" habitually dispense with privies and defecate in the fields or elsewhere, whenever the spirit moves them. The fight against uncinariasis thus resolves itself into a campaign of education and it is here that the commission in charge of the million dollars given by Rockefeller will find its chief field of usefulness. The commission plans to spend \$200,000 annually for five years, chiefly through the state boards of health, partly in a campaign of education, partly in an investigation into actual conditions, partly in lending assistance towards the direct eradication of the plague. A campaign of education similar to that

now being waged against tuberculosis might be inaugurated. The country physician above all must be interested, for he forms the natural center from whom correct ideas in regard to prevention of this disease would spread. The larger employers of labor should be interested. The country schools should be enlisted in the campaign. At present most of these schools in the poorer districts have no sanitary facilities whatever. The children, when they need to do so, go out and defecate on the ground, so that the school soon becomes surrounded by a belt of infected soil. As most of the children go bare-foot and must pass to and fro over this belt, it is strange that any escape infection. Travelling exhibits might prove a minor source of information as in tuberculosis. The difficulty lies in the inertia and indifference of the country population. As long as they treat any reference to the "lazy-worm" with scorn or laughter any attempt at systematic eradication of the disease will meet with great difficulties. Unfortunately the newspapers still encourage this attitude; they, too, will have to be brought into line. Ultimately all of these efforts will surely meet with success, but it will not do to be too sanguine in regard to immediate results.

The establishment of local laboratories throughout the South is another desideratum. At present the country doctor, without a microscope or the ability to use it, meets with insuperable obstacles in the diagnosis of obscure cases of hookworm. It should be possible for him to send a sample of stool to a nearby laboratory and to obtain a prompt and gratuitous diagnosis. Such laboratories are being established, but many more are needed.

The establishment of local free dispensaries for the treatment of impecunious hookworm patients, while desirable from some points of view, is not quite free from danger. Those able to pay would doubtless make use of them, as they do of similar institutions in the cities and an injustice to the local practitioners would result. Great tact would be needed, for, if the local doctors were antagonized, more harm than good would be done as regards the success of the campaign.

Once the campaign is in full swing, great good to the South should result. With the death rate from hookworm, that from typhoid would fall, since similar hygienic measures will combat both. Interest would be aroused in the fight against malaria, yellow fever and tuberculosis, and with a sturdy, healthy population a New South would arise.

OBITER DICTA FROM FOREIGN JOURNALS.

SIMPLE SURGERY.

The medical mind bears a family resemblance to all other minds in that, after grappling with problems which fairly bristle with complications and inundating itself with a vast array of technicalities, it turns with considerable gusto to the quietude which comes from incisive thinking and clear understanding. To accomplish this end is not without difficulty in these times of petty theories which sit astride one's intelligence and clamor for recognition, but that the happy goal may be occasionally reached when a broad philosophy is encouraged, is important enough to give us pause. And in the address which Dr. Richelot delivered on the subject of "Simple Surgery," before the Association française de Chirurgie on its twenty-fifth anniversary, we have just the sort of writing that is of paramount importance in effecting a return to a medical attitude that shall make for the ready appreciation of simplicity in the matter of so complicated a subject as modern surgery. Every critic believes that he knows the great secret of simplicity, but that this is far from the truth is nowhere better evidenced than when the surgical art of to-day is grilled by the censorious, who are too purblind to see that their very acrimony precludes a just estimate of the high value that inheres in this much-neglected mental attribute. Dr. Richelot's lines run as follows: I hardly think that you, who are assembled here to-night, realize that we are celebrating the twenty-fifth anniversary of our society. Whether or no you are moved in a like degree as myself, you cannot remain callous when I mention so distinguished a name as Professor Trélat, who was the first to teach us some important surgical truisms, whereby new ideas and new hopes engaged our minds, and the greatest zeal animated us to thwart the scepticism and resignation of those who had been our revered mentors. In truth, we had to retrace our steps and begin at the very beginning. The world in which we moved was made up of prejudices and errors, of a combativeness that upset our equilibrium, of a series of obstacles that delayed progress. But ours was the period of youth, and though our successes were attended with some misgivings, and our hesitations often amounted to disillusion, our courage was never dismayed. How fortunate are the students of to-day, who need fear on adverse criticism for indulging in the gentle art of thoroughly washing their hands prior to an operation. But we were less fortunate, for we were young in the Dark age of surgery, less than three decades ago.

The quarter of a century which has rolled by has been rich in research, in discussions, in solutions of intricate problems; there have been unforgettable teachers, who have traced step by step the evolution of surgery and have made its glories manifest. All the former presidents of this society knew their surgery so well that as operators they were admirable, albeit their extreme modesty was a bit old-fashioned. During the years which have elapsed prodigious work has been done, but though the progress has been dazzling, and may appear to the superficial as having a finality, I hasten to tell you such is not the case; surgery to-day is

as eager for new ideas as in those rather distant times when it was in its swaddling clothes.

At the beginning of this association, there was no lack of ardor in regard to the dressing of wounds; no lack of enthusiasm to ascertain the efficacy of new and novel operations. Our ambition could not be curbed; and before long we were invading the province of internal medicine and making ourselves quite objectionable to the general practitioner; in fact, our frightened confrères were clamorous in their demands to know exactly to what lengths our audacity would carry us, and to what inferior position, in the realm of medicine, we intended to reduce them. And here it would be well to ask: Is the surgeon the medical over-man, the necessary man in trying conditions, from whom prestige and authority should not be withheld? and, Is the medical practitioner the unprogressive entity who has remained in arrears so long that advancement is unknown to him? Let us squelch this untruth at once and admit in all candor, that the medical practitioners are just as scientific and ambitious as we are, and that they are our collaborators and often our teachers. This is too frequently overlooked because our successes are more palpable, more striking, more easily grasped by the laity; and just because our strength is abetted from without, we are boastful and inclined to vainglory. Velpeau is reported to have said: "Without erysipelas and purulent infection surgeons would have all the attributes of the gods." Erysipelas and purulent infection are almost *nil*, but the men who wield the lancet are just as human, just as mundane, as before this took place, and as for being gods, would the kindest critic advance such fulsome praise? I do not mean that we are not in the advance-guard of progress, but in my sober moods I am more inclined to remember what Montaigne said of the human mind than what Velpeau thought of the future of surgery; for the words of the essayist are just as apposite in regard to surgery as to the mind. Surely his saying that "Reason never stops; though at times it may be wrong, and again weak and easily led astray," with "reason" changed to "surgery" would be well to bear in mind always!

The sort of reason necessary to the best expression of surgery is only too often the victim of obstacles, of encumbrances, of wilful and foolish meanderings, which are not so much the work of those in the surgical ranks who are prone to charlatanism rather than to the art of surgery, as the obtrusions of false ideas, crude opinions, arbitrary conceptions, unmethodical attempts and above all, a lack of simplicity, on minds acceptive of sane ratiocination, and which are fostered by genuine surgeons who should be the last to deform the art of surgery through the advocacy of falsified facts that must lead to misguidance. Being enamored of simple surgery, my abhorrence of this state of affairs can easily be imagined, a feeling which surely finds justification in the fact that a great deal of our literature is indigestible, and that but slight service is rendered to the sick.

As is well known to you I have on more than one occasion advocated simple surgery. A derogatory opinion sometimes reads thus: "If you pay particular attention to the teachings of a surgeon you will note that the lessons to be gleaned are always the same." Now, though this statement is an exaggeration, it yet contains some truth, for the reason, that, though at first the mind may desire to burden itself with many and diverse ideas, it soon classifies them; a process that results in rooting out the unimportant ones, and retaining only those that have weight. The outcome of this is that the surgeon formulates a doctrine to be followed without divagations, and a directing idea which gives the same unvarying

expression to his operations that is seen in the chiseled work of a sculptor. Hence, there is some show of truth in the assertion that the surgeon follows certain routine lines, and that in his work there are undeniable indications that repetition has not been avoided. Nevertheless, though this charge is founded in fact and should therefore be the means to the end of making the art of surgery less complicated, I must admit that the matter of simple surgery is not as yet *un fait accompli*. In place of clear-cut ideas that would make for simplicity, what assails us in contemplating "the surgical situation" is that there is still enough incoherence to make us doubtful as to its future. True, some of us, after errors of judgment, vain and futile gropings, and many detours, have arrived at the desired goal of simplicity; but have the majority of surgeons passed out of chaos into the uniformities which should govern our special province?

My criticisms of modern surgery are not prompted by a reactionary feeling, nor is it my desire to be thought a pedagogue. I merely wish to convey to you some idea of all the tendencies of my career, the precepts I should like to see triumph. Now do not confuse simple surgery with that other sort of surgery which I have never countenanced, namely, simplistic surgery. Simplistic ideas are those which make a strong appeal to mental immaturity; simple ideas are those which experience teaches us. I have as much aversion for simplistic ideas as for tortuous and complicated ideas, since not infrequently they fraternize in textbooks, and are thus the ignoble means of crowding the minds of beginners with a perfect nightmare that is made up of one-sidedness, partiality, circumlocution, and a deplorable uncertainty. These simplistic ideas are of a hardy growth, but what is most condemnatory about them is that they are sufficiently insidious to pollute our better ideas. Have you not heard of the ingenious physician who has ascertained the weight of the soul? He weighed dogs before and after death, and found no variance. But how different was his experience with men! He found that cadavers weighed less than did the living bodies, and at once drew the conclusion that the difference represented the weight of the soul which had escaped after death! Thus is illustrated the tremendous force, the invincibility of simplistic ideas when they are brought to bear on questions which cannot be thought other than the most delicate.

It will not be difficult for you to recall the heated discussions which formerly took place as to what became of the uterus after the adnexa had been removed, and, above all, what became of the diseased adnexa after the uterus was extirpated. The partisans of vaginal hysterectomy upheld the theory that after the adnexa were evacuated there was no danger to the patient by leaving them in place, even in serious cases, for atrophy soon set in, and what with their final disappearance, patients were not long in making a good recovery. Péan was of this opinion, and on a certain occasion he expressed himself to his students as follows: "Undoubtedly the adnexa are cured after the uterus is removed since they are but adnexa." Do not remarks like these illustrate how a sententious utterance can be effective in putting a complete stop to discussions which should merit deeper insight and wider scientific knowledge than to be routed by a pithy saying?

How many instances I could cite to illustrate this tendency, on the part of well-known physicians, to offer mediocre explanations for the gravest medical problems! "The worst fault of the human mind," says Bossuet, "is to believe certain things because they ought to be and not because they are indisputable facts." This is an aphorism that makes

plain that the mind, though by some kindly critics considered impeccable, can be guilty of a gross error. But the easily-influenced physicians whom I have in mind jauntily cast aside all idea that it is possible for them to be deceived through any machination of their own mentality. If a matter needs clearing up so as to bring its good points before the medical public, or if a lucid explanation of a complex etiology is absolutely necessary, they are quite disheartened, even frightened, and to get back their mental equilibrium take readily to the primary causes in the hope of being thoroughly illuminated. When listening to their vapid words, so indicative of a sureness that is derived only from superficial thinking, I am always tempted to shout: "Behold another scientist who knows the weight of the soul."

Nothing can better convey to you my thought than the part that mechanical causes are supposed to play in surgical affections. In truth, I am not inappreciative of the laws of gravity, the inconveniences from the stagnation of fluids, and the advantage of draining dependent parts. In case an abscess is being treated what more natural than that the open door policy should be pursued? And where a wound looks suspicious, and doubts are entertained as to its asepsis, the drainage should be thought out with some attention to mechanics. But though all right-minded surgeons must admit this, there can be no doubt that physiological conditions dominate mechanical conditions, and that to attribute the genesis of symptoms to mechanical laws is a puerile piece of reasoning. To explain an arthritis which may spring up in the vicinity of a fracture, Gosselin advanced the theory that the serous effusion filters through the capsule and spreads throughout the articulation. Strange to say his acumen was well pleased with this explanation. Take for instance the explanations that are even now put forth to enlighten us as at the causes of uterine retroversion, though one would think in this age of complicated medical science such astounding simplicity would not be countenanced. Quite a number of physicians believe that this malposition is due to a too prolonged recumbency on the back; while others are of the opinion that the fault lies with the bladder which is not emptied often enough. What a waste of time these theories involve, and how wearily they drag their way through the text-books. Indeed, it would be a shade more reasonable to say that the cause is born of the tension to which the ligaments are subjected during pregnancy. But, on the other hand, many women, who have never conceived, have uterine retroversion, while others, who have passed through many confinements, are free from it. Hence it cannot be wrong to assert that a physiological state is responsible for the abnormal position, and that the tension of the ligaments is but an adjuvant cause. Is it not easy to determine, after some thought on the subject, the important rôle played by physiology in bringing about a condition that the superficial are ever willing to trace to a mechanical source?

But what are all these simplistic theories when compared with the widely heralded reason for the greater frequency of appendicitis in the male sex. According to a modern author this can be accounted for by reason of the psoas muscle being more developed, and therefore of greater activity in the stronger sex; and what more natural than that this highly developed muscle should determine the traumatisms that cause the disease! Can science do more than this in all its manifold labors, to dissipate the obscurities which have for years been clouding this pulsating question! Why give a thought to the lymphatic system, to direct intestinal infection, to hepatic diseases? Is not the solution at hand and have not our own

labors been without avail? Who would persist in his purblindness and stubbornly deny that the psoas muscle is treacherous enough to turn at any moment on the appendix, and by its unwonted activity cause a trauma sufficient to superinduce the disease!

Surely, I have said enough to convince you of the utter absurdity of simplistic theories. Simple surgery, on the other hand, is an altogether different matter, for it is the quintessence of a highly cultivated art, which is only mastered after deep cogitation illuminates the surgeon in regard to the many futilities of blundering researches, and the petty and vain-glorious ambitions of unreliable writers.

BOOK REVIEWS.

PRACTICAL DIETETICS WITH SPECIAL REFERENCE TO DIET IN DISEASES. By W. Gilman Thompson, M. D., Professor of Medicine in the Cornell University Medical College in New York City. Visiting Physician to the Presbyterian and Bellevue Hospitals. "Good diet with wisdom best comforteth men"—Tusser (1520). Fourth edition, illustrated, enlarged and completely rewritten. New York and London. D. Appleton and Company. 1909.

This is a fourth edition of the author's well-known works on Dietetics. It is a revision of previous editions following the St. John's general plan outline of the first edition, published in 1895. It incorporates the majority of advances made in this subject since the last edition. It embraces the discussion of dietaries, institutions, sections of the proper dieting and various ages of life for special occupations, increasing and diminishing body weight and of such complex problems as diseases which demand obstinate methods of dieting existing in combination. These and many other commendable sections make it probably the most exhaustive treatise upon dietetics published in the English language.

DISEASES OF INFANCY AND CHILDHOOD. For the Use of Students and Practitioners of Medicine. By L. Emmett Holt, M. D., Sc.D., LL.D. Professor of Diseases of Children in the College of Physicians and Surgeons (Columbia University), New York, etc., etc. With 239 illustrations including 8 colored plates. Fifth Edition, Revised and Enlarged. New York and London, D. Appleton & Co. 1909.

Although only a short time has elapsed since the fourth revision appeared, the rapid advance in the science of pediatrics has necessitated another revision of this popular text book. Changes are most notable in the chapters dealing with General Tuberculosis, Tuberculous Meningitis, Cerebro-Spinal Meningitis and Acute Poliomyelitis. In its present form the volume reflects the most advanced thoughts and teachings, and well deserves the appreciation accorded to it by the American profession as the standard text book of pediatrics.

LEGAL MEDICINE AND TOXICOLOGY. By R. L. Emerson, A. B., M. D. New York and London. D. Appleton & Co. 1909.

This new text book of legal medicine treats the subject from an eminently practical point of view. In writing this volume the author, as he states, constantly considered the needs of the general practitioner who so often quite suddenly finds himself confronted with a case that involves medico-legal questions of great importance. The subject is presented in three parts. The first part is devoted to legal medicine, the second to toxicology. The third part contains extracts from various state laws affecting the practice of medicine, published and in effect, revised to January 1, 1909. By means of a very carefully prepared index the wealth of information compiled in this excellent volume is made easily accessible.

A MANUAL OF MIDWIFERY. By Thomas Watts Eden, Obstetric Physician and Lecturer of Practical Midwifery and Gynecology, Charing Cross Hospital, etc., etc. Second edition, with 42 plates and 236 illustrations in the text. Chicago, W. T. Keener & Co. Price, \$3.50.

This volume in our opinion represents the very best type of text book for students. All unnecessary material is carefully eliminated, and the important facts presented systematically and with unexcelled clearness. The illustrations are well selected and without exception clearly elucidate the text. Paper, print and the whole make up of the book, including the binding, and its size, are excellent.

THE MUSCLES OF THE EYE. By Lucien Howe, A. M., M. D., Professor of Ophthalmology, University of Buffalo, etc. In two volumes. Volume II. Pathology and Treatment. Illustrated. G. P. Putnam's Sons. New York and London. The Knickerbocker Press. 1908.

In this truly exhaustive treatise, Dr. Howe has given us the results of his lifelong study of the ocular muscles, together with a systematic classification of

muscular defects. The book represents an immense amount of labor and personal research, and will doubtless serve as the standard for many years to come. Dr. Howe's interest in the subject has fortunately not led him into the realms of vague and fantastic speculation, as has so often been the case with men who have attacked this subject.

Dr. Howe may well feel gratified at the cordial reception the first volume received at the hands of his ophthalmic confreres. There is no reason to suppose that now that the work is completed, the volume of praise will be in any way diminished.

THE I-P LOOSE LEAF PHYSICIAN'S LEDGER AND CASE RECORD. Irving-Pitt Manufacturing Company, Kansas City, Mo.

This is a loose leaf ledger bound in black cowhide, held together by metal rings that are readily opened, and equipped with linen tabbed index sheets. Each page is $7\frac{1}{4} \times 4\frac{1}{2}$ inches in size and has on one side a code ledger suitable for one year's account of one patient and on the other a form for two brief histories. Dead accounts can thus be taken out and filed away separately from the live ones. It should prove a labor-saver. The price is \$4.75 or \$6.00, according as it is equipped, with 100 or 200 sheets.

LEHRBUCH DER PHYSIOLOGIE DES MENSCHEN. HERAUSGEGEBEN VON N. ZUNTZ UND A. LOEWY in Berlin. Mit 306 Abbildungen und 2 Tafeln. Leipzig: Verlag von F. C. W. Vogel. 1909.

A text-book of physiology may be written in two ways, each of which possesses advantages of its own. When an eminent physiologist of wide knowledge and ripe experience writes such a book, it may be distinguished by a charm of style and a uniform excellence that render it delightful reading. There will be little or no repetition and the book will form an organic whole. Physiology, however, has now become so extensive and complex a science that no one man can hope to master the entire field as in the days of Du Bois Reymond. Hence the action of Zuntz and Loewy of assigning each chapter of their book to some man specially versed in that department of the subject. The leading German physiologists have collaborated in the production of this work. Special mention may be made of an interesting if somewhat sketchy introductory chapter on general physiology by Verworn, of a complete if rather dry account of muscle and nerve physiology, by Weiss, of a fascinating account of the central nervous system by Exner. Zuntz treats the difficult subject of metabolism with the clarity and the literary charm that characterize all of his work. In all there are seventeen collaborators, to discuss whose work in detail is forbidden by limitations of space. In a word the great merit of the book lies in the fact that each chapter is written by a master in its special field. The subject is treated critically rather than discursively, the book is a philosophic review rather than an encyclopedia of physiology and is suitable rather to be read from cover to cover than to be consulted as a book of reference for the elucidation of special points.

ANNALEN FÜR DAS GESAMTE HEBAMMENWESEN. Vierteljährlich ein Heft im Umfange von 5-6 Bogen. Preis: Mk. 10.—per annum. Verlag von Elwin Staude in Berlin. W. 35.

The question of proper regulations for women practicing as midwives at the present time is widely discussed by almost all governments of Europe. It is the purpose of this new publication to keep its readers abreast with all the reforms attempted and actually instituted by the authorities of the various European states. The very same problem is in need of serious consideration also in this country and we do not doubt that American physicians interested in this reform movement will be glad to learn of the existence of this new journal.

COLLECTANEA JACOBI. In eight volumes. Collected Essays, Addresses, Scientific Papers and Miscellaneous Writings of A. Jacobi, M. D., LL.D. Edited by Wm. J. Robinson, M. D., New York. The Critic & Guide Company. Price per set, \$15.00.

In the editor's preface to this collection of Jacobi's works he says: "I know of no other man, among the living or among those who have passed on, who in our country has had such an important influence on the development of medicine in all its phases, as has Dr. Abraham Jacobi, of New York." With this statement, few who have looked into the development of medicine in America would care to disagree. It is therefore a matter of congratulation that Jacobi's really monumental contributions to American medicine should have

been collected, carefully edited, and put forth in a permanent form worthy of their author. Jacobi's influence in medicine has been widespread, not only in pediatrics but in general medicine as well. It will, however, always be remembered that Jacobi was the first man in America to give to pediatrics the important place that it deserves. This he did not only by his voluminous and in many instances epoch making contributions to the literature of American pediatrics, clinical and pathological, but also by the dominating force of his personality. Jacobi was the first professor of pediatrics America ever had. We have had none greater.

It is therefore most fitting that his works should be given to the profession in durable and at the same time accessible form.

Of the eight volumes the first, second and third contain Jacobi's special pediatric papers, largely clinical.

Volumes four and five have the papers on general therapeutics and pathology.

Volumes six and seven contain important addresses together with biographical and historical papers.

Volume eight has miscellaneous papers and complete indices.

The publishers have done their work very well, the press work is excellent.

The set of books will surely find its way to the shelves of many of those (whose number is legion) who revere Jacobi as a man, who have admired him as a teacher and who have been stimulated to better things in medicine by the force of his luminous example.

A HANDBOOK OF MEDICAL DIAGNOSIS. By J. C. Wilson, A. M., M. D. Illustrated. Philadelphia and London: J. B. Lippincott Co., n. d.

Before the days of thin, opaque paper a book of 1435 pages like this of Dr. Wilson's would either have been of enormous bulk or would have necessitated subdivision into at least two volumes. As it is the author has succeeded in compressing into one not too bulky volume an unusually complete treatise on medical diagnosis. Especially as regards physical diagnosis, the reader will find this a most satisfactory book of reference. If the merit of Dr. Cabot's book lies in its selection of those methods which the gifted author himself has found most useful, this volume of Dr. Wilson has the advantage of containing nearly everything of any importance in this field and of leaving its selection to the reader. Both methods have their value and both volumes should find a place on the physician's book shelves.

PHYSICAL DIAGNOSIS. By Richard C. Cabot, M. D. Fourth Edition, Revised and Enlarged. With Five Plates and Two Hundred and Forty Figures in the Text. New York: William Wood & Co., 1909. Price \$3.00 net.

Dr. Cabot's book is less a complete description of all the methods of physical diagnosis than a vivid discussion of those procedures which he has personally found most useful. This involves definite merits but also equally striking incompleteness. His account of the methods described is extremely interesting and clear, the illustrations are excellent and to the point, his judgment of their diagnostic significance eminently sane. On the other hand, some signs of generally recognized importance, are omitted or dismissed with a few words. Thus we have failed to find any discussion of orthopercussion, Grocco's sign is dismissed with a word, the use of the sphygmo-cardiograph is barely mentioned, although the comparatively useless sphygmograph is given more space than it deserves. The chapter on radiology is, however, particularly good.

LEHRBUCH DER SPECIFICISCHEN DIAGNOSTIK UND THERAPIE DER TUBERKULOSIS. Von Dr. Bandler und Dr. Roepke. Vierte Auflage. Verlag von Curt Kabitsch (A. Stuber) in Wuerzburg, 1910.

Although scarcely six months have passed since the publication of the third edition its complete exhaustion has called for a new print. The authors have availed themselves of this opportunity to include in the new edition the very latest contributions to the question of diagnosis and therapy of tuberculosis.

CLINICAL EXAMINATION OF THE URINE AND URINARY DIAGNOSIS. By J. Bergen Ogden, M. D. Illustrated. Third Edition. Philadelphia and London: W. B. Saunders Co., 1909.

A third edition of this useful book will be welcomed by teachers of urine analysis. It is not a book of reference since it makes no attempt at giving a systematic account of the multitude of tests suggested for urinary diagnosis, nor does it discuss comprehensively the rarer urinary abnormalities. It is distinctly a book for teaching in medical schools or for the table of the busy practitioner being interestingly and clearly written and emphasizing the essential by the exclusion of the unessential.

BOOKS RECEIVED.

NEUERE UNTERSUCHUNGEN UEBER DIABETES INSIPIDUS. Von Dr. H. Braeunig-Stettin. Wuerzburger Abhandlungen. X. Band. 2. Heft. Wuerzburg. Curt Kabitzsch (A. Stuber's Verlag). 1909. Preis: Mk. 85.

LEHRBUCH DER SPECIFISCHEN DIAGNOSTIK UND THERAPIE DER TUBERKULOSE. Von Dr. Bandelier und Dr. Roepke. Vierte erweiterte und verbesserte Auflage. Mit einen Vorworte von Wirkl. Geheimrathe Professor Dr. R. Koch. Wuerzburg. Curt Kabitzsch (A. Stuber's Verlag). Preis geb. Mk. 7.

PATHOLOGISCHE PHYSIOLOGIE. Lehrbuch fuer Studierende und Aerzte. Von Dr. Ludwig Krehl. Ord. Professor und Director der medizinischen Klinik in Heidelberg. Sechste Auflage. Preis: Mk. 15. Verlag von F. C. W. Vogel in Leipzig.

MEDICAL DIAGNOSIS: A MANUAL FOR STUDENTS AND PRACTITIONERS. By Charles Lyman Greene, M. D., St. Paul, Professor of Medicine and Chief of the Department in the College of Medicine, University of Minnesota; Attending Physician, St. Luke's Hospital and the City and County Hospital; Chief of the Medical Clinic in the University Hospital. Third Edition, Revised, with seven colored plates and two hundred and forty-eight illustrations. Philadelphia: P. Blakiston's Son & So., 1012 Walnut St. 1910. Price \$3.50 net.

DIAGNOSTIC THERAPEUTICS. A Guide for Practitioners in Diagnosis by Aid of Drugs and Methods Other than Drug-Giving. By Albert Abrams, A. M., M. D. (Heidelberg), Consulting Physician to the Mount Zion Hospital and the French Hospital, San Francisco. With one hundred and ninety-eight illustrations. Rebmman Company, 1123 Broadway, New York. Price, cloth,

LIVING ANATOMY AND PATHOLOGY. The Diagnosis of Diseases in Early Life by the Roentgen Method. By Thomas Morgan Rotch, M. D., Professor of Pediatrics. Harvard University. Three hundred and three illustrations. Philadelphia and London: J. B. Lippincott Company.

THE INTERNAL SECRETIONS AND THE PRINCIPLES OF MEDICINE. By Charles de M. Sajous, M. D., Fellow of the College of Physicians of Philadelphia, etc., etc.; formerly Lecturer on Laryngology in Jefferson Medical College and Professor of Laryngology and Dean of Faculty in Medico-Chirurg. College, etc., etc. Philadelphia: F. A. Davis Co., Publishers. Volume second, containing: Chapters XIII to XXXII, dealing with the Secretion of the Adrenals in Respiration, Adrenal Active Principle as Ferment, as the Dynamic Element of Life; Pituitary Body as Governing Center of Vital Function; the Leucocytes, Pituitary, Thyroid, Parathyroids and Adrenals as the Fundamental Organs in Pathogenesis, Immunity and Therapeutics; the Internal Secretions in their Relation to Pharmaco-Dynamics, Pathogenesis and Therapeutics.

SERUM DIAGNOSIS OF SYPHILIS AND THE BUTYRIC ACID TEST FOR SYPHILIS. By Hideyo Noguchi, M. D., M. Sc., Associate Member of the Rockefeller Institute for Medical Research, New York. Fourteen illustrations. Philadelphia and London: J. B. Lippincott Company.

"THE QUEST." By Dr. Thomas A. Stoddard, formerly of Halifax, Nova Scotia; presently of Pueblo, Colorado. Cochrane Publishing Company, Tribune Building, New York. 1909.

FIFTH ANNUAL REPORT OF THE HENRY PHIPPS INSTITUTE FOR THE STUDY, TREATMENT AND PREVENTION OF TUBERCULOSIS. Feb. 1, 1907, to Feb. 1, 1908. Edited by Joseph Walsch, A. M., M. D. Published by the Henry Phipps Institute, 238 Pine St., Philadelphia, Pa. 1909.

W. B. Saunders Company, the medical publishers of Philadelphia and London, have just issued a new edition—the thirteenth—of their handsome illustrated catalogue. It contains some twenty new books and new editions, and besides numerous black-and-white illustrations, there are two color cuts of special value. We strongly advise every physician to obtain a copy—sent for the asking. It will prove a ready guide to good medical books—books that we all need in our daily work.

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EDITORIAL.

PSYCHOLOGY AND HAMLET.

The unimpeded march of psychology is one of the interesting phenomena of the day. No present-day literary or art critic can command an audience unless he reads into the subject under fire the psychological reasons for its having been launched by its progenitor. Every portrait that he draws with his facile pen, illustrative of what the author or painter really meant by a cryptic word or an eccentric line, fairly drips with the overflow of his multifarious psychology; and so far removed, in his estimation, are even the commonplacenesses with which many characters in and out of fiction are studded, that they needs must be tortured by many pen-pricks so that they shall no longer bear the insignia of their humble birth. Indeed, such extensive inroads of a destructive character has this delectable chapter in advanced science made into the well-erected and carefully-nurtured canons of the older form of criticism, that were any-one of literary pretensions temerarious enough to run counter to what is now accepted without a demur, it would not be long before he would be thrust, by the mighty phalanx of critics garbed in psychological motley, into the undesirable company of those half-forgotten wielders of the critical pen—Macauley, Hazlitt, Lowell, and the impossible Dr. Johnson. When some years back Lombroso took the character of Dante between his psychological jaws and shook it into the inchoate mass which always reads its title clear to a ready understanding on the part of psychologists, we thought the definitive chapter had been written in the depressing lucubrations with which the newer criticism had attempted to engulf us; but that we reckoned without our host has since been evidenced on more than one occasion, but never so perfectly as in the case of Dr. Ernest Jones, of the University of Toronto, who has recently, in the pages of the *American Journal of Psychology*, given vent to all his pent-up

psychological feelings in regard to a Shakespearean character, which has been the bull's-eye these many years for the unswerving shafts of the deeply critical. We are now speaking of Hamlet, that very patient individual whom the critics of all shades and nationalities have subjected to such constant grilling, that one is justified in thinking that surely at the present hour nothing can remain of the much-maligned gentleman but a few charred bones!

The distinctive line in the wilderness of Dr. Jones's criticism is that Hamlet was unconventional, and inadaptable to his surroundings, because his overpowering affection for his mother was frustrated, first, by his own father and then by his uncle, when he became his step-father. Affection for one's mother should not be decried by anyone, provided the human receptacle which is host thereto has the equilibrium to withstand its daily onslaughts; and far be it from us to make mock of a desirable attribute that is only too often absent in most modern families. But if it is true, as Dr. Jones pleads, that this affection has possibilities of passing into another feeling, which he, in consonance with psychological teachings, calls "sexual," we ought to watch its possible metamorphosis with greater care, lest unawares it steals a march on us, and before we are cognizant of its full presence dominates the individual whom our unobserving eyes have classed with the normal. Now this note of warning, we understand from Dr. Jones's essay, was never brought home to Hamlet by any of his medical friends; hence he nurtured what was in the beginning a natural affection into that phase of abnormal sexuality whose bitternesses are the one thing, according to our limited judgment, that invariably fasten the attention of the modern psychologist.

That the character of Hamlet was quite simple when it emerged Minerva-like from the Jovian-Shakespearean brow is no longer a matter of controversy among those unworldly folk who have preserved their clarity of thought in the maelstrom of modern criticism; and though much might be said in censure of their aloofness, at least they have not added to the burdens of modern civilization by weighting us with theories that destroy our faith in human nature. We all know that Hamlet was melancholy over the fact that his widowed mother had married a man who was quite unworthy of her queenly attributes; that he indulged in considerable brooding that ran into philosophical remarks; that he was at variance with all his surroundings. These dissatisfactions, we take it, ought surely suffice to make him the sort of philosopher whose truths are always grist to the insatiable mill of pessimistic observers, no matter what the date of their birth. Therefore, why incrust him with other defects that can do naught but prejudice us against the personal beauty of the poetical lines which Shakespeare puts into his mouth? Innocency

need not necessarily be the dominant note of modern psychology, but is it absolutely incumbent on all its expositors that they must see sexual abnormality in nearly all the unexplained acts of the unconventional?

SOCIETY'S RESPONSIBILITY FOR PREVENTABLE DISEASE.

The most remarkable result of the modern investigation of infections is the growth of the opinion that it is the duty of society to protect its members from such diseases, and that, if it fails, it must pay for the damage inflicted. It is a legal axiom that we have surrendered our primitive right to exact redress from an individual who injures us in any way. We cannot legally prevent injury unless we are so situated that we cannot call on the constituted agents for protection. The law even expects us to run away from a man attempting to kill us, and if we kill him in self-defense we are not held blameless unless we can prove that it was the only thing we could do. The same principles guide our conduct with regard to a diseased person who is liable to give us a fatal infection. We must call on society to protect us by removing the danger; in the meantime we must avoid it. No one dreams of shooting a smallpox patient who approaches us, yet it would be just as sensible as shooting him if he were flourishing a loaded pistol in our faces and there was no agent of society at hand to restrain him.

In other words, the organization of society has gone to such an extreme, that we are absolutely dependent upon it for existence. It can even call on us to sacrifice our lives for its protection when its existence is threatened in war. It has assumed entire charge of protecting us until it needs us. Each member has a right to call on the social organism for help when he is threatened with any injury from another member. Nor is it the duty of any member to seek out the dangers, for that is part of the police power and agents are paid a living wage for the duty. If the agents fail, society is responsible for their acts of omission and commission.

It is now a matter of proof that nearly every infection has been derived from a prior case, which should have been surrounded by safeguards to prevent injury to others. When we were in complete ignorance of the way we contracted disease, no one thought of holding anyone responsible. It was looked upon as an unavoidable accident,—an act of God, such as death in floods or storms. But now we know that certain diseases can be prevented and that no one but society itself can guard us. We must be assured of life, liberty and the pursuit of happiness or the

government we have evolved is a failure. If we visit another city in which there are no safeguards thrown around dangers, and we contract typhoid, for instance, then we have a legitimate cause for action against the municipality for appropriate damages. The courts can no longer hold that the disease was an act of God, when the evidence shows it was the result of neglect of society's agents.

These are the arguments now used in the suits already instituted to collect damages for preventable infections, providing of course due warning had not been given by the corporation to keep away and efforts made to prevent trespass on the dangerous area. The actions have resulted from a feeling of resentment against municipalities which have deliberately refused to be guided by sanitary advice and have thereby permitted preventable deaths. It does seem that many more such suits should be instituted and fought out to a successful issue, because it is increasingly evident that governmental agents will not prevent disease until it is found too expensive to neglect this duty. When the damages awarded the injured begin to amount to serious proportions, it will be found easier to use the sums in preventing the injuries. In other words, public health is always measured by dollars. A decent respect for modern sanitation can only be created by a fear for the expenses of disrespect. Sanitarians have utterly failed to convince the public that prevention is cheaper than cure, though the figures have been presented time and time again. Now let the damage suits drive the lesson home.

Prevention of disease is an essential of civilization and has been neglected too long. The future is destined to see the most elaborate social machinery for protecting the members from infections and the sooner the new era is inaugurated the better and cheaper. No man can kill his neighbors by shooting them or by infecting them—one is just as much murder as is the other. The time is, therefore, surely coming, and near at hand, too, when a person will be convicted of the crime of manslaughter when he has violated future sanitary laws and thereby spread fatal infections. The medical profession is vitally interested in these developments for upon it is the burden of convincing the public that certain infectious diseases are preventable, and that society must prevent them. Let the suits go on, and let physicians testify faithfully to the facts, and show the juries that the complainants were injured through governmental neglect, when such facts are susceptible of legal proof.

OPINION AND CRITICISM.

Within very recent days many new clinical methods of easy application and undoubted value have been added to the working forces of the practitioner. Every one recalls when the search for *spirochæta pallida* was as problematic as hunting for hidden treasure: the early staining methods required much skill and more perseverance to produce results. These were succeeded by the "dark-field illuminator" which permits easy findings, but is rather too complicated and expensive for general use. To eliminate the disadvantages and yet retain the principle of this apparatus, Burri has applied India ink in a surprisingly simple manner. A drop of serum obtained in the usual way by scraping the lesion is placed on a slide and mixed with a drop of India ink, diluted if necessary with water, and then spread by the edge of another slide exactly as blood smears are made. It is air-dried, and is immediately studied under the oil immersion lens. The time occupied by the whole procedure is less than two minutes, and the results are sharp and clear, the spirochætæ standing out as unstained spirals in a dark brown background. As yet no work has been written in America on this method, but the results from Germany seem to indicate that here we have a rapid, simple, and reliable diagnostic aid for general use.

Interest in cerebro-spinal meningitis is considerable because of the changed prognosis due to the Flexner-Jobling serum. The classical cerebro-spinal fluid, on account of its high polynucleosis and the presence of the meningococcus, makes the diagnosis easy in most cases, but in some cases not only can the specific organism not be seen but the fluid itself may not show any of the usual signs of meningeal inflammation, and in such conditions the diagnosis is difficult. Vincent, of Paris, making active application of known immunity reactions, has found that precipitation will occur when one part of anti-meningitis serum is mixed with fifty or one hundred parts of cerebro-spinal fluid and allowed to remain at body temperature for eighteen to twenty-four hours. The reaction is made evident by a cloudiness in the fluid, and according to Vincent is only obtained in positive cases of meningitis due to *diplococcus intra-cellularis*. Not quite as specific, but in many respects even more valuable is the sodium butyrate reaction described by Noguchi, of New York, and already verified by numerous investigators. To one part of cerebro-spinal fluid free from blood is added five parts 10 per cent. butyric acid, the tube boiled, one part normal sodium hydrate solution added, and the whole again brought to a boil. In from two minutes to two hours in positive cases, a definite finely or coarsely granular pre-

citrate is seen in the fluid, whereas negative cases show no change or merely a slight diffuse cloudiness. The reaction is due to increased globulin and indicates meningeal inflammation of any kind. Originally worked out as of specific value in the diagnosis of syphilitic and parasymphilitic invasion of the nervous system, it was soon found that its limitations were by no means so narrow. In conjunction with the other diagnostic points it is of considerable assistance in differentiating, for instance, cerebral syphilis and brain tumor, tabes or paresis and functional neurosis, true meningitis due to any of the bacteria, and the condition of meningismus so common in children and in the acute infections.

Though as yet none of these tests has been sufficiently proved to give any one absolute value, each is so simple as to warrant a very general study of its usefulness. In this way only can the numerous advances of laboratory medicine be made of direct clinical value.

Whenever certain diseases are specially studied their prevalence increases markedly, as is shown, for instance, by cancer, tuberculosis, and appendicitis. Hence the conclusion to be drawn is that, in all probability, numerous diseases now considered rare, will, with the advance of scientific method and careful clinical observation, ultimately be classified among the common ailments. At present the thorough analyses being made of feces promise to result in many discoveries, especially in relation to intestinal parasites. Holt states that of ten thousand dispensary cases, positive evidence of intestinal parasitic infection was found in only seventy-nine instances; but more recent studies by O. M. Schloss, of New York, cast considerable doubt on the validity of these generally accepted conclusions. Schloss examined two hundred and thirty children in the dispensary service at Bellevue Hospital, and found that sixty-seven harbored intestinal worms, of which number fourteen or 20 per cent. were infected with the dwarf tape-worm (*hymenolepis nana*). If these proportions are verified by further statistics it will indicate that the dwarf tape-worm, generally known as a very rare parasite, is the most frequent cestode and one of the commonest of all intestinal parasites. The ova are not difficult to find, provided sufficient time and care be spent with the microscope. Schloss further found that the numerous rather vague symptoms referring especially to the gastro-intestinal and nervous systems were alleviated by the removal of the infecting parasite. Schloss's work, correlated especially with that of Stiles and his co-workers, strongly suggests that the incidence of intestinal parasites bears a direct relation to the care with which they are sought.

PNEUMONIA still holds undisputed sway, and so far the best efforts of preventive medicine have been powerless against its onslaughts. Since Mennes' first animal experiments proved the possibility of making a protective serum for the smaller animals, hopes of clinicians and investiga-

tors have been centered in the numerous efforts toward specific therapy in man. Specific chemo-therapy has been vaunted, tested and found useless; and as yet no one has succeeded in proving the absolute value of an immune serum. Consequently a report by such a credited worker as Neufeld of Berlin, must be received with expectant hope, for his recent contribution promises much. He has made a serum from horses which he thinks is curative for man. The serum is obtained after progressive immunization with enormous doses of pneumococci, and its activity is supposed to be due to "bacteriotropins" (immune opsonins). The serum is injected intravenously, Neufeld thinking that the failures with previous sera are due to insufficient concentration of the anti-bodies, since the amount of circulating poison in pneumonia must be extremely great to produce the high grade of intoxication seen in severe cases.

The most important observation of all was in the actual testing of the serum in cases of pneumonia. In the small series in which it was tried, the results seemed excellent and certainly warrant a continued study of its effects. But the series was limited, and in pneumonia, a small percentage of cures does not make for certainty. Yet much encouragement should be ours from reports like Neufeld's.

ALTHOUGH at present chemistry and its relations to biological problems is occupying the center of interest as it has done for some years, the point of view has changed somewhat. Whereas nitrogen metabolism formerly was the goal of chemical effort, within the last few years the inorganic salts have received so much attention that at the present-day the curve of enthusiasm for the baser metals registers fever heat. The well-known fact that the blood maintains such a constant chemical equilibrium that the changes in its reaction are hardly appreciable by delicate tests, perhaps prevented any general recognition of the inherent possibilities of salt metabolism. It was rather surprising to find that pneumonia was associated with changes in the excretion of common salt, and even more surprising was the relief of tetany by the administration of calcium salts. The "Salzfieber" of the Germans, produced in infants by subcutaneous or oral doses of sodium chloride, and a similar phenomenon following the ingestion of sugar, correlated with clinical observations on alimentary intoxications, drew workers in pediatrics to a study of the profound influence of inorganic salts in diseases of children. Naturally the food was studied, and the attack on milk again underwent a new variation. Previous work on bacterial contents, caloric values, protein, fat, and carbohydrate distribution was relegated to an unimportant position, and calcium, magnesium, sodium and potassium became the open sesame to the welfare of the child. When, however, the truth of things is finally learned the pendulum will again swing back stopping at a position influenced by more than one force. History repeats itself.

PROBLEMS of medical education are worrying all countries. Germany with its central control of the universities, undoubtedly has reached the highest efficiency; England is still harassed, and the United States is evolving her own system. No educational standards apply to all peoples, and what has worked so well in Germany may not fill the needs of our polyglot population. But where imitateness is permissible, Americans may copy and improve. The raising of the standards of required preliminary education has become very general, and a graduate of one of the better schools is now supposed to have been trained in other things than the art of practice. A further step in the process of raising educational standards is the affiliation of the school of medicine with the university. If the university is to fill the definition of Cardinal Newman, it must teach universal knowledge; and if it does, there is little room for the isolated school of special knowledge. The intimate association of the science of medicine with other university sciences, and the difficulty in separating pre-medical from medical studies makes this affiliation natural. The big state universities have, or are preparing to have, medical departments, as have most of the endowed schools. Recently The College of Physicians and Surgeons of Columbia University has announced a plan of moving from its present quarters to new buildings on the University grounds. The new group will include laboratories and hospitals, and thus another important medical school will be connected morphologically as it is functionally with the university and university ideals.

LITERARY NOTES.

The second series of Dr. Lucien Nass's highly interesting book "*Curiosités médico-artistique*," has just been published at Paris by Albin Michel. The perusal of this work, be it said at once, need not necessarily be limited to medical readers, for its scope is wide enough to interest all students of history. Moreover its contents are of such a nature that artists can read with profit the criticisms as conceived from a new and novel standpoint. Again, what can be more interesting than for physicians, who have devoted much time and study to anatomy and physiology, to examine, in the light of their learning, illustrations of pictures well-nigh half-forgotten, but which show how thoroughly artists are equipped with the faculty of transferring to the canvas all the essential points of these studies? That the illustrations are profuse is attested by their number which amounts to some three hundred, but aside from quantity they have a still greater claim on our attention, since they represent such painters as Raphael, Paul Veronese, Jordaens, Van Mieris, Franz Hals, and Goya, and some of the most characteristic work of the best French caricaturists, Garvani, Daumier and others. To single out any one

chapter in a book that has the deep interest of Dr. Nass's work would be doing the other chapters an injustice; but since our predilections lie in a certain direction—and what critic, be he never so poor, has not predilections?—we would call the reader's attention especially to the chapters, "La Pathologie par l'Image," "Les Aveugles dans l'Art," and "L'Interprétation de la Vue à travers les trois siècles derniers."

In Dr. Fabien Girardet's recent work "La Mort de Jean-Jacques Rousseau, étude médicale," we have an excellent exposition of a certain phase in the Genevan philosopher's life, which has been variously treated by such literary men as Jules Lemaitre and Francis Gribble. The sub-title of this new book at once enlightens us as to its value from a purely medical standpoint; but while admitting this advantage it would be well to remind the reader that the medical theories do not overshadow the historical and literary values of the production. The death of Rousseau, as is known to all interested in his history, has always been considered an affair of considerable importance, and for years has been the subject of acrimonious controversy; hence, in bringing his medico-legal knowledge to bear on this matter, the author throws a much-desired light on those dark corners which have been such excellent food for literary scandal-mongers. In deciding what was really the cause of death, the present historian does what only a medical philosopher would think of doing—namely, he studies in detail Rousseau's mentality, moral status and definition of life in general, as reflected in his published works, and in the mass of curious documents yet unpublished; a wise proceeding, indeed, when one recalls that of all the French writers of the eighteenth century, Rousseau's works were the most personal. In this way he discards those unfortunate rumors about suicide by shooting or poisoning, and comes to the conclusion that death was caused quite prosaically by uremia; a most convincing solution, we take it, of a much discussed but hitherto unsettled question.

In a recent number of "Les archives orientales de médecine," there is a rather unique paper by Georges Petit, on the imitative faculty of easily-influenced persons, and the wisdom of ancient philosophers who, aware of this special weakness in many of their followers, shaped their teachings to fit a not infrequent defect in human nature. Psychology may or may not have been understood by the ancient philosophers, but be this as it may their deep knowledge of our weakness was no unknown quantity, for invariably they played on what must be considered a very human foible—the desire to imitate a mental bias that is foreign to our natures. By abetting this defect their following increased, and it was not long before they were lauded, not only as thinkers but as prophets. Of all the early philosophers, Pythagoras was probably the most successful in attracting crowds, and soon after he took up his residence in Crotona, in the house

belonging to the celebrated athlete, Milon, his lessons in philosophy exercised so great an influence over the minds of his disciples, that everything he said, no matter how unimportant or devoid of proof, became at once a firm conviction with them; hence they were wont, in allusion to their beloved philosopher's impeccability, to clinch all untoward criticism by the weighty words: "The Master has said it." According to Rollin, the historian, Pythagorean philosophy made as much stir throughout Italy as in Crotona, and the very face of philosophic thought was changed. Justin described at length the reforms Pythagoras instituted in Crotona. Realizing that the citizens were given over to luxury and debauchery, Pythagoras reminded them of the advantages to be achieved from a frugal life. He lauded virtue and extolled its beauty and graces. He told the women to practice the arts of chastity and not forget obedience to their husbands. But though virtue was often his theme, his favorite subject was undoubtedly frugality, which he considered the highest of all virtues. He admonished the women for wearing the expensive fabrics and jeweled ornaments which they deemed necessary to their rank, and warned them so often of the crime of luxury that even the most obstinate, and those most enamored of their rich attire, sacrificed their baubles at the altar of the deity who ruled the town, namely, Juno; thus substantiating what he had always advocated, that the greatest ornament a woman could bear was untarnished virtue and not the wearing of jewels or rich fabrics. The exhortations of Pythagoras met with the sort of success that must have been most gratifying to him; for he saw his words sink deep into the conscience of the people, though all along he must have been aware that his swaying of their thought was merely the power he had of bending weaker wills to his own, by stimulating their imitative faculties in emulation of his intellectual peculiarities. When we come to modern times we are not without instances which illustrate with what readiness certain persons assume a pose, in the hope that by so doing, they will ere long reach the exalted pedestal of the great men they are imitating, well that they copy only their faults; as was instanced in the large number who some years ago made a cult of the poet, Alfred de Musset, only to find themselves, when it was too late, adepts in alcoholism. These insensate beings are not without representatives in every generation; and whether it is the white waistcoat of Robespierre, the frill of Mirabeau, or the red shirt of Garibaldi, that has caught their fancy, their imitative faculties are ever on the alert to seize the opportunity and make enough of it, so that their own personalities shall approach talent, if not genius. Animal psychology, which is really nothing but the power of imitation bolstered up by what the humane are pleased to call memory, is a subject that is to-day engaging the thought of a number of serious writers, but how insignificant it is by comparison with that phase of human psychology which can explain the imitative faculty in man!

ORIGINAL ARTICLES.

VAGINO-FIXATION OF THE UTERUS FOR THE CURE OF CYSTOCELE.

By SAMUEL WYLLIS BANDLER, M. D., of New York City.
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In the minds of many who have not been able to follow the more modern trend in gynecology, there exists considerable confusion as to the value of vaginal fixation of the uterus for the cure of cystocele.

Cystocele in its real, uncomplicated type is a true hernia of the bladder, with the uterus, even though somewhat descended, still in anteflexion or anteversion. There are variations from this type, of course, for with a very marked ptosis, or descensus or total prolapse of the uterus, there is more or less descent of the anterior vaginal wall up to the extreme degree of complete eversion of the vagina. In these cases, of necessity, the bladder follows the downward course of the anterior vaginal wall. There are other instances in which the descent of the vagina is more marked than is the ptosis or descent of the uterus, so that in some cases, the prolapsing vagina may be the responsible factor in causing a retroverted and descending uterus to end in total prolapse. In these cases, when the uterus by its marked descent fixes our surgical attention on that organ mainly, vaginal fixation of the uterus has, in the mind of almost anyone, a reason for its performance. Inasmuch as the operation performed for that indication has as one of its most valid justifications, the very fact that it puts the bladder out of the way and prevents forever a subsequent appearance of that organ in the vagina or beyond the vulva, there is no reason why the same operation should not be done when the bladder itself is the one organ which is out of place.

Vaginal fixation attaches the uterus so closely to the anterior vaginal wall that the union is and should be a most firm and unyielding one; hence, in that event pregnancy should not be permitted. In a goodly proportion of cases, patients upon whom this operation is done are beyond the child-bearing years. On the other hand, a very large proportion are still menstruating and pregnancy may in these cases be prevented by the simple step of resecting a portion of either tube. This

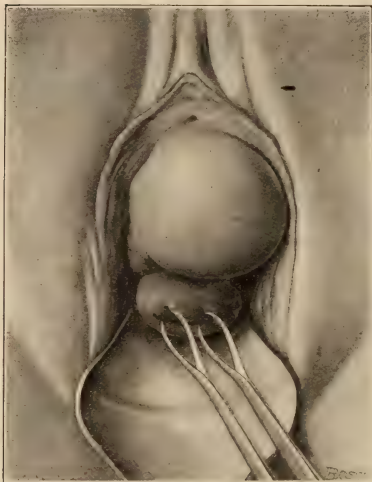


FIG. 1.—Typical, well-marked, and extreme type of cystocele, with uterus in anteversion. Cervix has been pulled down to the vulva by traction on the volsella.

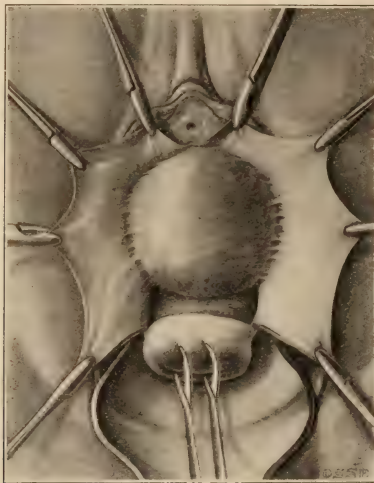


FIG. 2.—Vaginal flaps dissected from the cystocele, showing unusually intimate connective-tissue attachments of bladder to its vaginal covering.

step in no wise interferes with menstruation and does not induce an artificial menopause.

The two methods usually employed in the treatment of cystocele are those of simple anterior-colporrhaphy, or a more extensive anterior colporrhaphy, so extensive that the entire anterior vaginal wall is removed and substituted by a sharp-angled union of the lateral vaginal walls.

Another operation which is being advised by Goffe consists in separating the bladder from the anterior wall of the cervix and uterus, and from the anterior wall of the vagina, and attaching a portion of the bladder to the anterior wall of the broad ligaments, and then closing the anterior vaginal incision after removal of flaps of various sizes. An objection to this operation may be found in the fact that the bladder is kept anterior to the peritoneum, which is reflected from its posterior wall to the anterior wall of the uterus. This peritoneal fold limits the backward displacement and dilatation of the bladder, and keeps it within narrow limits. In addition, this operation guards in no way against a subsequent descent or altered position of the uterus itself.

Hence, the best method in my experience consists in so placing the bladder that it is put backward into the peritoneal cavity, resting upon the posterior surface of the uterus, and the uterus is fixed to the anterior vaginal wall—acting as a buffer against any descent of the bladder—fixing the uterus in a position from which it can never retrovert or markedly descend or prolapse; for retroversion is the first step in the development of a marked ptosis, descensus or prolapsus uteri. The operation is an extension of the original principle of Dührssen and Mackenrodt who originated this procedure in its earlier form for the correction of uterine retrodeviations.

The present method is the result of years of experience by Dührssen and others, and has been sufficiently tested to warrant its general acceptance in the type of women who are no longer to bear children.

Figure 1 shows a typical, well-marked and extreme type of cystocele constituting a true hernia of the bladder with its covering of vaginal mucosa reduced to extreme thinness. The uterus is in anteversion and only slightly descended. In such cases, as in all cases of anterior vaginal celiotomy, the operation is begun by a transverse incision made, usually, with the scissors, across the anterior wall of the cervix just below the lower border of the bladder. The superior lip of this incision is lifted up by two pairs of artery forceps, and with the aid of the scissors, and the index finger covered with gauze, the bladder is thoroughly separated from its attachment to the anterior wall of the cervix and from the uterus up to the vesico-uterine fold of peritoneum. A longitudinal incision is then made, beginning at the middle of the transverse incision, and extending up very close to the urethra. This incision is made by a pair of long, sharp-pointed scissors, the lower blade of which is introduced between the vaginal mucosa and the bladder; by successive snips the incision is extended to any desired length. The technique of this pro-



Fig. 3.—Uterus delivered by anterior vaginal celiotomy into the vagina and beyond the vulva, showing ease of approach to non-adherent tubes and ovaries. The bladder is held up behind the symphysis by the anterior speculum.

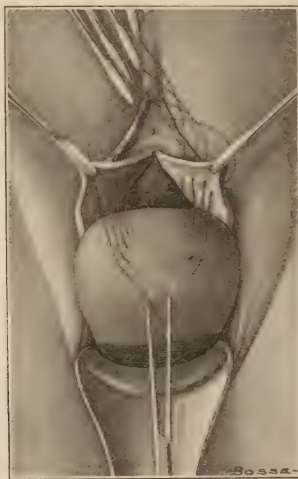


Fig. 4.—Four fixation sutures are passed through the anterior wall of the fundus uteri and the edges of the vaginal flaps at their uppermost part. The bladder is to be seen posterior to the fundus.

cedure has been thoroughly described in the *American Journal of Surgery*, March, 1909.

After the longitudinal incision has been made the two artery forceps, which have been applied to the superior lip of the transverse incision, are used to evert the vaginal mucous membrane, and dissection is begun with a few snips of the scissors and is then continued with the finger or thumb, covered with gauze, until two very large flaps result from complete separation of the bladder from its attachment to the anterior vaginal wall.

In extreme cases, like those illustrated by Fig. 1, the vaginal mucosa is so thin that the separation has to be done with extreme care with a very sharp knife. Whereas, ordinarily, separation of the bladder is complete in 5 minutes, in a case like Fig. 1 it may take from 10 to 15 minutes to carry the dissection as far as illustrated in Fig. 2, in order not to injure the bladder, and to avoid tearing the vaginal flaps or leaving islands of vaginal mucosa behind.

Fig. 2 shows two flaps produced by carrying the knife-dissection as far laterally as necessary, after which further separation of the bladder from these flaps can be carried out with the aid of the finger covered with gauze. The character and form of the connective tissue attachments of the bladder to the vaginal mucosa is well represented in Fig. 2. That this condition is a true hernia of the bladder is clearly illustrated in Figures 1 and 2.

After the bladder has been thoroughly separated, an anterior vaginal speculum is introduced underneath the bladder, and the bladder is lifted up out of the way and pushed back of the symphysis. There is then exposed to the eye the fold of peritoneum which runs from the posterior wall of the bladder to the anterior wall of the uterus, the so-called vesico-uterine fold of peritoneum. This is lifted up with a pair of mouse-toothed forceps, and with a pair of scissors a transverse incision is made running the full width of the uterus. The anterior vaginal speculum is then placed underneath the bladder and extending through this incision in the peritoneum into the peritoneal cavity, and the bladder is again lifted up out of the way and placed behind the symphysis. With the anterior wall of the uterus now clearly exposed to the eye, several tenaculum forceps are applied in succession, and the fundus is gradually pulled through this opening in the peritoneum, the cervix being at the same time pushed back over the surface of the posterior speculum into the vagina. When the uterus is finally delivered through the vagina beyond the vulva, we have a picture well represented by Fig. 3.

Figure 3 shows the space which exists between the anterior speculum which holds the bladder up out of the way, and the posterior wall of the uterus, the space through which any intra-peritoneal manipulation upon the tubes and ovaries must be carried out. It illustrates clearly the accessibility of the tubes in cases where it is desired to produce artificial sterility. This can be done by applying two ligatures about the tube, one inch apart, and then resecting the intervening area of tube and burying.

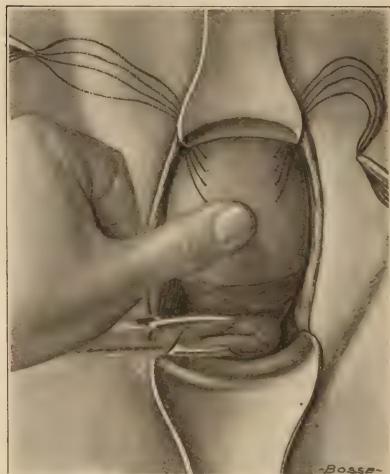


Fig. 5.—After passing the fixation sutures, the fundus uteri is pushed back along the under surface of the anterior speculum, the cervix at the same time being pulled out toward the vulva.



Fig. 6.—Pulling on the 4 fixation sutures brings the anterior wall of the scarified fundus into intimate contact with the raw surface of the vaginal flaps. The bladder now rests on the posterior surface of the uterus.

the exposed ends under the peritoneum of the meso-salpinx. Attachment of the uterus to the anterior vaginal wall is then carried out after resection of any desired area of the anterior vaginal flaps. For instance, most of the flaps exposed in Fig. 2 are resected so that the remaining portions consist of thick vaginal mucosa.

Four sutures are now used, 2 of 20-day chromic catgut No. 3, 2 of fairly heavy braided silk. The sutures are passed through the edges of the upper part of the longitudinal incision (after any desired resection has been done), then through the anterior wall of the fundus uteri at its uppermost part, and then through the edge of the opposite lateral



Fig. 7.—Shows the 4 fixation sutures tied, the remainder of the longitudinal incision and the transverse incision being closed. Except with small uteri, it is advisable to do a high amputation of the cervix.

vaginal flap (Fig. 4). The anterior wall of the uterus is then scarified with a sharp knife so that union of the uterus to the raw surface of the vaginal flaps will be an intimate one. The cervix is then pulled out from the vagina over the posterior speculum and the fundus is pushed back along the under surface of the upper speculum within the peritoneal cavity (Fig. 5). Tension is then exerted on these four sutures and the anterior wall of the uterus is brought closely into apposition to the vaginal flaps, care being taken that no section of the bladder is allowed to intrude itself between the uterus and the vaginal flaps. This manipulation is illustrated in Figure 6. With the uterus held in the position illus-

trated in Fig. 6, I very often pass a No. 2 chromic suture through the vaginal flaps and the uterine wall just above the uppermost of the 4 sutures, so that when tension on the 4 sutures is released no pouch of the bladder will descend to obstruct firm union while these 4 sutures are being tied as illustrated in Figure 7.

It can be seen in Figure 7 that the anterior wall of the uterus is firmly attached to the anterior vaginal wall, and the bladder of necessity is within the peritoneal cavity resting on the posterior wall of the uterus. The upper part of the longitudinal incision may be united with running catgut suture before the procedure illustrated in Figure 7. As a rule, however, the 4 fixation sutures bring the edges of the vaginal mucosa sufficiently well together. The edges of the longitudinal incision, below the 4 fixation sutures, are then united by running catgut suture, and then the transverse incision is closed as illustrated in Figure 7.

It is occasionally advisable to leave a space in the transverse incision through which a twist of iodoform gauze may be introduced to drain off any oozing of blood which might accumulate between the lower part of the uterus and the vaginal flaps. The vagina is then thoroughly packed with gauze, introduced in such a manner that the cervix is pushed backwards and upwards into the hollow of the sacrum. The gauze is then removed at the end of 5 or 6 days; the silk sutures are allowed to remain from 4 to 6 weeks.

It is usually advisable to catheterize these patients for 4 or 5 days, as slight difficulty in urination may be experienced, but usually for only a very short time.

In many cases it is found that with a long cervix or descended uterus, the cervix does not remain sufficiently high up and far back in the vagina, so that a high amputation of the cervix, unless the uterus is very small, is very often an advisable step.

These drawings, however, simply illustrate, with some modifications, the Dührssen technique in the performance of vaginal fixation.

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PREGNANCY IN ITS RELATION TO DISEASE.

By HUGO EHRENFEST, M. D., of St. Louis.

During pregnancy, demands are made practically upon all the vital organs for an increased functional activity. These organs, if in a healthy condition, will, as a rule, be able to respond to the demand, although frequently they will be called upon to act to their physiological limit. We know that these functional changes during pregnancy lead to distinct anatomical and histological changes in the kidneys, liver, heart, thyroid gland, and probably in other organs. If we take as example the alterations in the kidneys or liver, we have to acknowledge that these tissue-changes are of a definite pathological character. They must, however, be regarded as still physiological because they are found in a very large percentage of all pregnancies; because they do not cause any serious disturbance of the patient's health; and, finally, because they disappear with the termination of gestation. While this is the rule it is not rare for the functional and histological alterations brought about by pregnancy to take on a truly pathological character. Under such conditions pregnancy may become the immediate and direct primary cause of a disease.

Distinctly different is the accidental complication of pregnancy by disease. If the vital organs, upon whose function the normal progress of pregnancy largely depends, are at the time of impregnation in a diseased condition, or if they are accidentally attacked by disease in the course of pregnancy, their necessarily augmented activity will usually lead to a rapid deterioration of their pathological condition, and they will not be able to respond to the increased demands; thus the normal progress of the pregnancy may be endangered. According to these viewpoints the most important relations of pregnancy to disease will be considered under the following four headings: (1) Pregnancy as Cause of Disease; (2) The Effect of Pregnancy on the Course of a Complicating Disease; (3) The Effect of a Complicating Disease on the Course of Pregnancy; and finally (4) The Effect of a Complicating Disease on the Child.

PREGNANCY AS CAUSE OF DISEASE.

If we exclude from our consideration in this connection gynecological anomalies, such as subinvolution, malpositions, lacerations, genital infections, etc., we must acknowledge that pregnancy is not often the primary and direct cause of disease. Additional proof is continually furnished for the contention that in most instances of the apparent development of a disease as the immediate result of pregnancy, we actually deal with an acute aggravation of a pathological condition antedating impreg-

nation, and which has remained unrecognized because in the non-pregnant state its symptoms were very slight. As a good example diabetes may be cited. Many authors still quote pregnancy as an important etiological factor in the causation of this disease. Recently Williams was able to collect from the literature on the subject but 66 definite cases of true diabetes in pregnant women. Of this number, the disease was positively present in 55 instances before the occurrence of the pregnancy in question. Many authorities claim that every acute nephritis appearing during pregnancy is in reality but an acute exacerbation of a chronic nephritis heretofore unrecognized. It is not uncommon for an albuminuria to make its appearance during the first pregnancy of a woman who, in childhood, probably as the result of one of the acute infectious diseases, had an attack of acute nephritis.

Whenever pregnancy directly causes a true pathological condition—a disease which impairs health and often endangers or even terminates the patient's life, the pathogenetic factor is almost without exception of a toxic nature. The introduction into the maternal system of the poisonous end-products of the fetal metabolism, of toxins probably formed in the placenta (in the syncytial tissue), the mechanical impairment of certain vital organs and their occasional inability to respond completely to the increased demands during pregnancy, lead to a state of toxemia—the expression of a disturbance in the equilibrium which should be maintained between the formation and disposal of toxic material. The quality and quantity of these retained toxins, together with the condition of the particular organ or organs affected, probably determine the character of the resulting pathological state. A certain degree of toxemia during pregnancy must be considered still within the physiological limits. The change from the physiological to the pathological, both in relation to symptoms and anatomical alterations, is often so gradual that in many instances a sharp line between health and disease can be drawn only with difficulty. Thus morning nausea may change into hyperemesis and end fatally in the form of uncontrollable vomiting. The physiological hyperemia of the liver during pregnancy, which probably always results in distinct histological changes of the liver tissues, may be followed by alterations of a more serious nature. We know a distinct type of icterus recurring in some women with every pregnancy, the jaundice usually appearing in the latter part of pregnancy, and preceded at times by a hemoglobinuria. In some cases the hepatic changes are of a distinctly malignant character and result in a fatal acute yellow atrophy of the liver. During pregnancy, probably as the expression of a toxemic condition, the reflex irritability is distinctly exaggerated. This increased irritability of the nervous system accounts for peculiar attacks of cough, hiccough and sneezing during pregnancy, explains the not uncommon grave forms of ptialism, and undoubtedly must be regarded a secondary factor of considerable importance in the causation of uncontrollable vomiting or eclamptic convulsions: diseases distinctly toxic in their

origin. In more than half of all primigravidae typical changes of a degenerative nature occur in the kidneys, commonly comprised under the term "kidney of pregnancy." Occasionally the direct transition of such a "kidney of pregnancy" into a chronic parenchymatous nephritis or an atrophic kidney has been observed. It is also probable that at times kidneys after one pregnancy may retain slight anatomical lesions which, during subsequent pregnancies, render them liable to develop more serious changes. And this brings up another problem in the relation of pregnancy to disease—namely, the question of distinct susceptibility for certain diseases acquired during pregnancy. It is claimed that in this manner can be explained the importance of pregnancy in the etiology of leukemia, or of myasthenia gravis. There undoubtedly exists, during pregnancy, and in the puerperal state, a marked tendency for the development of a neuritis. It is an undeniable and striking fact that diabetic women immediately after termination of pregnancy often acquire an acute tuberculous infection.

THE EFFECT OF PREGNANCY ON A COMPLICATING DISEASE.

To a certain extent this has been considered in the preceding paragraphs. As a rule, the onset of pregnancy will lead to the aggravation of a pathological condition existing in any of the vital organs. A disease hitherto unrecognized may thus become manifest. The exacerbation very often is the result of the increased toxicity of the blood circulating through the affected organ, the toxicity in turn being partly due to the insufficient work of the affected organ. This peculiar vicious circle can be best illustrated by referring to the kidney or the liver, the organs most frequently injured in this manner. If these organs, at the beginning of pregnancy, are in a pathological condition, they will be unable to respond to the demand for an increased functional activity. Toxic material will be retained in the blood, which, now in a state of abnormally high toxicity, passes through these organs. A rapid deterioration of their pathological condition will be unavoidable, and there results an actual decrease of their functional ability with a further rise in the toxicity of the blood, until finally a state of complete functional inability and inactivity is reached.

In other diseases the development of unfavorable symptoms is due to the additional strain placed upon these organs. This is the case in most cardiac lesions. The mechanical interference with circulation by the pressure of the large uterine tumor, the strain and mental excitement of labor with its excruciating pains, finally, sudden changes in the blood-pressure at the moment when the fetus is expelled or as the result of severe hemorrhage, often disturb the complete compensation of a valvular lesion. Very serious circulatory disturbances and, during labor, acute edema of the lungs or paralysis of the heart, may be the unexpected result. It is probably this additional strain of pregnancy which accounts for the distinct harmful effect of pregnancy on a pulmonary tuberculosis.

In women of neuropathic tendencies, who come from neurotic families, a failing of general health, infections, intoxications (eclampsia), undue excitement or anxiety, and exhaustion during pregnancy or immediately after labor, may change a latent tendency to mental abnormalities into an acute psychosis, or in curable forms of the disease may cause a recurrent attack.

In some instances the harmful effect exerted upon a concomitant pathological condition is of a mechanical nature. The pregnant uterus presses against the ureters, certainly a factor of importance in cases of pyelitis or hydronephrosis. There are several cases on record of acute general peritonitis developing immediately after labor, being caused by the tearing of adhesions surrounding a well-walled off chronic appendiceal abscess.

In general, the diseases, existing at the time of impregnation, are of the chronic type, and as has been shown, pregnancy, as a rule, alters markedly their usual course. Distinctly different are the conditions presenting themselves in the case of the sudden development of a disease in the course of pregnancy. Here we deal in the majority of instances with one of the acute infectious diseases. Their course usually is but slightly, if at all, affected. Premature termination of gestation, however, is a rather common occurrence. This accident leaves the patient in a weakened condition and renders her less resistant to the infection. She becomes more susceptible to serious septic infections starting from the genital tract. We need only mention the complication of pregnancy with variola, erysipelas, scarlatina or diphtheria. The wide open cervix easily admits bacteria to the uterine cavity and favors their passage through the tubes into the peritoneal cavity. Gonorrhea in the puerperal state shows a marked tendency to ascend and frequently leads to an acute pyosalpinx and peritonitis. For obvious reasons the pregnant state increases the possibility and danger of an acute nephritis, of acute pulmonary complications, and exaggerates the general toxic symptoms. During pregnancy, variola and typhoid fever frequently appear in the dangerous hemorrhagic form. These are the factors which are chiefly responsible for the larger mortality of all infectious diseases in pregnant women.

At least in all infectious diseases the premature termination of pregnancy represents the most dangerous complication, and this leads us to the consideration of the third problem in the relation of pregnancy to disease—viz.,

THE EFFECT OF A COMPLICATING DISEASE ON THE COURSE OF PREGNANCY.

The most common causes of interference with a further progress of pregnancy are premature activity of the uterus, destructive changes in the maternal and especially fetal placenta, and the death of the fetus. It is probable that lack of oxygen or an accumulation of carbon-dioxide in the maternal blood causes uterine contractions. A comparatively acute form of carbon-dioxide intoxication is met with in cases of extreme

respiratory or circulatory complications. Obviously in these cases the fetus is also in extreme danger of immediate asphyxiation. Experience shows that in cases of pulmonary affections a persistent cough, and in cases of intestinal affections an exaggerated peristalsis, may become responsible for the premature activity of the uterus. In certain infectious diseases pathological changes in decidua and placenta are produced by the hematogenic transmission of the responsible bacterium directly to the uterine cavity. The resulting acute inflammatory conditions, usually accompanied by necrosis, hemorrhage and detachment of the placenta, may terminate the course of pregnancy. In cases of chronic maladies of the kidneys or heart, serious hemorrhages during pregnancy and during labor are quite common. The placenta in these cases very often contains large infarcts, which, if very extensive, may result in the death of the fetus. The death of the fetus may be directly due to a high temperature or the transmission of the infection from the mother to the fetus in utero. Fever during pregnancy noticeably affects the fetus. A slow rise in temperature is distinctly better borne than a sudden one. A temperature of 104° persisting for some time will usually cause the death of the fetus. The fact is to-day well established that a direct bacterial invasion of the fetus is possible if the infection, by localization in the placenta, has produced a partial destruction of tissue in this organ. Such a transmission has practically been proved for all bacterial diseases. If the infection of the fetus is accompanied by extensive local disturbance in the placenta, as in syphilis, the effect upon pregnancy is most deleterious.

But even when a complicating disease does not prevent the progress of pregnancy to term, it still may exert a harmful effect on labor or the puerperium. We have already referred to the increased danger of a serious puerperal infection in the presence of such diseases as variola, erysipelas, scarlet fever or diphtheria, and to the tendency of gonorrhea to produce an acute pyosalpinx or a peritonitis. A pronounced anemia, or certainly a hemophilia, will greatly augment the risks incident to labor. Certain diseases—and again it must be stated that gynecological anomalies will not be considered—often lead to distinct obstetrical complications. Thus in certain heart lesions, but especially in cases of diabetes, a hydramnios is frequently found associated with abnormal presentations of the fetus. Finally, a complicating disease may distinctly alter the prognosis of labor by reason of sudden serious symptoms demanding obstetric operations, ranging from *accouchement forcé* to Cesarean section.

THE EFFECTS OF A COMPLICATING DISEASE ON THE CHILD.

The most disastrous effects of a complicating disease on the child we have already mentioned—viz., the extinction of its life in case of premature termination of pregnancy. In a very general way it may be stated that at least in all infectious diseases, including syphilis, the death of the fetus is the more probable, the earlier in pregnancy the maternal infection

occurs. Infections, late in pregnancy, including syphilis, may leave the child unharmed. In a large percentage of cases mothers seriously sick give birth to weakly children. This weakness often is due to prematurity, often to underdevelopment as the result of the poor condition of the mother's health or the partial destruction of placental tissue. The frequent necessity of terminating labor artificially, further adds to the risks of the child. These children may be born sick. They may have been able to withstand the infection transmitted from the mother. Often the disease acquired in utero remains latent for a shorter or longer time, as is often the case in syphilis. Children born by women suffering from a nephritis or diabetes, often show albumin or sugar in the urine. In diabetes, especially, such a condition often develops later in the life of these children. This fact brings us face to face with the complex question of the hereditary transmission of disease. No attempt will be made here to discuss adequately this intricate problem. Many of the theories and opinions explaining this question stand either unproved, or are undoubtedly exaggerated or actually untrue. We have to accept the fact that syphilis or alcoholism—frequently they appear combined in the same individual—plays a rôle in the etiology of malformations and mental anomalies, especially in imbecility, insanity, and epilepsy. We know that in certain families cases of insanity, tuberculosis, hemophilia or diabetes appear with such striking frequency, that we must assume that a tendency towards this disease probably has been transmitted to the fetus in utero. If, however, we carefully analyze these cases, especially in relation to tuberculosis and syphilis, and in the latter disease include all the known manifestations of the tertiary stage, we are often able to ascertain that the infection actually has occurred in post-fetal life. The close contact existing between mother and young child, especially if it is breastfed, undoubtedly furnishes ample opportunity for the transmission of these diseases. Or the infection may have occurred during the process of labor itself, as *c. g.*, in cases of gonorrhea or syphilitic lesions of the vagina. It is evident that in cases of tuberculosis and syphilis, permanently, and in many of the acute infectious diseases, at least temporarily, a close contact between mother and child must be avoided, whenever the child is apparently healthy. This implies the prohibition of breastfeeding, a problem of far-reaching importance. The rationale of prohibiting all mothers affected with an infectious disease from nursing apparently healthy children is obvious and does not need further discussion. If, however, the child bears the signs of the contracted infection, or if the mother is suffering from a non-infectious disease, the decision whether breastfeeding seems permissible or is contraindicated will rest upon a careful consideration of the mother's physical fitness to stand the strain of lactation. As the result of chronic inanition, of loss of blood, of tuberculosis or diabetes, the patient may be in such a weakened condition that the question can be easily settled. Greater difficulty will be experienced in certain cases of renal or cardiac affections,

if the disturbances are not very serious, or if they were acute only for a short time. Indeed, the termination of labor may bring about a very rapid improvement in the complicating disease. Some authors apodictically state that all cardiac lesions strictly contraindicate breast-feeding. This embargo is positively unjustifiable in numerous cases, and moreover unnecessarily cruel to the child, for, as we have already shown, it is just in these cases that the child is weak and in special need of mother's milk. The physician's decree not to allow the child to nurse must be based on the careful analysis of all the features presented in the individual case, and should be influenced by the recognized fact that breastfeeding enhances the slim chances the majority of children born under these conditions have to survive.

In closing the consideration of the effect that an intercurrent disease has on the child, we would refer to the interesting fact that in cases of acute infectious diseases the fetus in utero may acquire immunity. If the child is born alive it may bear the signs of a still active infection in the form of a skin eruption (scarlatina), or in the form of a characteristic blood reaction (Wassermann's in syphilis). Again, it may offer conclusive evidence of complete recovery in the form of scars (variola), peeling of the skin (scarlatina), or in the shape of a blood reaction (Widal's in typhoid fever). We may assume that in this manner the fetus has acquired active immunity against certain infections. In the opinion of other writers, however, this immunity is only passive, temporarily acquired by the transmission of antitoxins which have formed in the maternal system. It would be tempting to speak here concerning a most fascinating problem which undoubtedly will interest a future generation of physicians—namely, antenatal pathology and, especially, antenatal therapy. Very little has been accomplished so far in this respect; but therapeutically, at least, even our limited knowledge, concerning the transmission of antitoxins and the transition of soluble chemical substances to the fetus in utero, has already yielded good results, protecting the fetus against the inroads of syphilis through the administering of certain drugs, and against variola, by vaccination of the pregnant woman.

The consideration of the mutual relation of pregnancy and concomitant disease, as far as presented in this paper, has necessarily called for an enumeration of all the harmful results. Thus the importance and frequency of an injurious effect may have been unavoidably over-exaggerated. In a very large number of instances, renal and cardiac anomalies do not produce even noticeable symptoms. The internist, as a rule, only meets with the cases in which a disease has been acutely and seriously aggravated by an intercurrent pregnancy. He usually considers the complication of disease with pregnancy a graver issue than the obstetrician. The latter often—or we may say—too often limits his interest to the obstetrical side of the case. He frequently overlooks the complicating disease until its existence suddenly and forcibly is revealed

to him by an eclamptic convulsion or a sudden collapse. Leyden, the eminent internist, claims that about 40 per cent. of all women with serious heart lesions meet their death in connection with childbirth. Fellner, who has carefully studied the relation of cardiac lesion to gestation in Schauta's clinic, where the material is almost unlimited, believes that only in 14 per cent. of the cases is the presence of the heart failure recognized by the attending obstetrician, while probably in 84 per cent. it is actually overlooked, simply because cardiac symptoms are not manifest. The necessity of a careful physical examination of every pregnant woman is obvious. Diseases when detected, or when appearing during pregnancy in general, require the same treatment as in the non-pregnant state. Pregnancy hardly ever will be found a contraindication against any urgent operation, whether intraperitoneal or extraperitoneal. The fact should, however, be borne in mind that operations on the external genitalia, even the removal of venereal warts, has a tendency to interfere with the progress of pregnancy. There are practically no drugs that in case of necessity could not be given to the pregnant woman. Quinine, usually regarded a dangerous ebolic, most successfully prevents abortion in cases of malaria by its prompt and specific effect upon the sudden high elevations of temperature. In all feverish conditions the deleterious effect upon the fetus should be reduced by attempts to keep the temperature down. Repeated cold sponging will prove successful in many instances. In the treatment of true diabetes the attempt, usually made to reduce or if possible, remove the sugar entirely from the urine, must be carefully graded. In arranging the dietary of a pregnant diabetic the fact must be properly considered that the fetus also is in need of a sufficient amount of nourishment, and that during pregnancy the usually assumed requirement of approximately 2500 heat units per day is distinctly increased. In dealing with such cases it should not be forgotten that the sugar, so often found in the urine of the pregnant but, especially, of the puerperal woman is occasionally lactose, and that even the presence of glucose does not prove the diagnosis of diabetes. During pregnancy the sugar metabolism is noticeably disturbed, and the assimilation power even for starches distinctly lowered; therefore, a transient or alimentary glycosuria is not a very uncommon occurrence in the course of a perfectly normal pregnancy.

Concurrent diseases may necessitate special ways of management of labor. Very often labor has to be terminated by artificial means. In uncompensated heart lesions, and in cases of pulmonary disease, version or forceps extraction has quite often to be resorted to for the purpose of shortening the suffering and avoiding further exertion. In cardiac lesions strong pressure should be exerted against the abdomen by a tight bandage or a weight at the moment the child leaves the uterus, as an attempt to counteract the sudden fall in the blood pressure. Serious danger to the patient's life, which often quite suddenly arises in heart lesions, in eclampsia, etc., calls for such serious operations as *accouche-*

ment forcé or even Cesarean section. If we consider these facts carefully and critically, we must admit that in an attempt to save the seriously endangered patient we must resort to artificial means of delivery. If we furthermore consider the various obstetrical operations employed in these emergencies, we are forced to the conclusion that, in general, the danger of the particular operation required, increases almost proportionately with the seriousness of the patient's condition. We certainly add risk to risk in an attempt to help in the endeavor of avoiding the catastrophe.

Can we avoid this issue by interrupting the pregnancy artificially in an early state?

We shall refrain from the discussion of the moral side of this question. The right of the physician deliberately to destroy a fetal life certainly is debatable. If moral considerations prevent the physician from suggesting such a sacrifice or the parents from consenting to it, the strict dictates of conscience are followed. The physician who suggests artificial abortion very often has to base his advice upon the principle that the mother's life is more valuable than that of the fetus in utero. This principle is certainly only socio-economic and not moral. In many instances, however, the physician realizes that the patient is in a hopeless condition, and that the fetus will lose its life by the death of the mother, which seems imminent. He cannot feel that he is actually killing this fetus when he decides to interrupt the pregnancy in an attempt to save at least the mother. The physician is acquainted with the fact that even in such a hopeless state the termination of pregnancy, spontaneous or artificial, is occasionally followed by an immediate improvement, even by complete recovery. Eclamptic convulsions, or vomiting which seems uncontrollable, cease, as a rule, with the death of the fetus often before its actual expulsion. The appearance of a retinitis albuminurica or of detachment of the retina in a case of nephritis in the non-pregnant state, is conclusive of the hopeless condition of the patient; on the other hand, in pregnant women these diseases have not infrequently been seen to disappear after the premature termination of pregnancy. The rapid progress of a pulmonary tuberculosis so frequently seen with the onset of pregnancy, very often stops after an abortion. Facts like these have forced the obstetrician to include artificial termination of pregnancy in the therapy of certain serious complications that occasionally arise in the course of pregnancy as the result of a concurrent disease. Extreme care must be taken in establishing the justification for this heroic interference in the individual case. No hard and fast rules can be given for the indications in each disease. Thus most text-books state that a laryngeal tuberculosis, in view of the imminent danger of an acute glottis edema during labor, positively calls for medicinal abortion. In some cases this rule has not been obeyed; nevertheless the mothers have passed unharmed through labor. A prominent Italian physician still claims that tuberculosis of any form positively indicates the interruption of every preg-

nancy. That such a broad ruling is unjustifiable cannot be denied. Without entering into a special consideration of every disease, it may be stated, in general, that artificial abortion may seem justifiable if pregnancy markedly aggravates the complicating disease; if such aggravation continues in spite of the careful execution of the special mode of treatment indicated by the disease; if a further deterioration of the patient's condition would result in her death; and if the prevention of a further aggravation of the disease would seem to give hope of preserving or at least lengthening her life. It is obvious that considerable experience is required to determine positively in each individual case that all these conditions have been complied with. Therefore, no physician should take the responsibility of deciding alone on the necessity of artificial abortion. It seems desirable to decree by law that the consultation with another experienced practitioner, or with a recognized specialist, be required for the purpose of establishing the justification of an interruption of pregnancy for therapeutic reasons. Such laws could successfully prevent the unscrupulous physician from plying so openly his nefarious business under the guise of scientific medicine.

We can now answer the question asked before: Does induced abortion preclude the undesirable compulsion of adding the risk of artificial forms of delivery to the already present dangers of the patient? Not entirely. The patient is probably saved from that further aggravation of her disease, which should be expected during the progress of pregnancy to full term; still artificial interruption of gestation certainly cannot be considered a process entirely free from danger. Induced medicinal abortion is the therapy of necessity, and not of choice. The ideal form of treatment is the prophylactic which successfully prevents the appearance of any of the serious complications enumerated in the preceding pages. This prophylaxis consists in the prohibition of marriage, or in the prevention or impregnation in women, who suffer from a disease which occasionally or often leads to dangerous complications when associated with pregnancy.

PROHIBITION OF PREGNANCY AND PREVENTION OF IMPREGNATION.

Marriage can be prohibited only by law. The desirability of such laws is to-day generally conceded and there is a well-founded hope that in our country, at no distant date, such laws will be enacted and probably enforced by several states. The physician can only counsel against marriage. In this manner he may occasionally prevent a marriage, but he should never resort to any means that could make him liable to prosecution for breach of his obligation to professional secrecy. Not rarely the physician is asked by an anxious mother whether her daughter, suffering from a certain disease, is in a fit condition for marriage. In answering this question he assumes a grave responsibility. To deny to a woman marriage may often be unjustifiably cruel. Marriage, as a rule, means to her an improvement of her social condition and life; it

may save her from worries and from the necessity of working for her support; and it may lead her into better, more hygienic surroundings. Thus marriage may mean to the sick woman the chance to improve or recover. On the other hand, the permission to marry may lead to chronic invalidism, to serious disease, and even to premature death. Not every marriage, however, necessarily results in pregnancy, and then there is still one more form of prophylaxis available—the prevention of impregnation. Again we shall avoid a discussion of the moral side of this question. Wherever religious reasons preclude the use of any special means or appliances for the prevention of pregnancy, complete abstinence from cohabitation may be resorted to as the most reliable form of protection. A consideration of various facts presented in the foregoing pages would seem to force the conclusion that the physician is not only justified but bound by duty, under certain conditions, to warn against marriage or impregnation. In the concluding lines an attempt will be made to give him suggestive but certainly not binding rules of action in relation to the most common and most important diseases.

Tuberculosis. Serious alterations in the course of a tuberculosis are so frequently caused by an intercurrent pregnancy that the physician should dissuade every tuberculous girl from consummating marriage. Most emphatic must this warning be, whenever the patient has a tuberculous affection of her larynx, or when a pulmonary tuberculosis is complicated by a renal or cardiac lesion. Not rarely a rapid aggravation of the disease is observed when pregnancies follow each other in too close succession. In such cases the patient must be advised to prevent a new impregnation, and it hardly can be denied that in some of these cases the question of sterilisation, probably by means of the resection of the tubes, would have to be considered.

Heart lesions. The dictum of a French writer, "No marriage for the unmarried sufferer of a heart disease, no pregnancy for the married sufferer, no nursing for the afflicted puerpera," although accepted by many authorities, seems incompatible with the results of very careful recent investigations in this question. It would be entirely too harsh and unjustifiable to deny marriage to every girl who has a well-compensated valvular lesion. She should be properly informed of the risk that pregnancy probably would imply. Only in cases where there are ever so slight symptoms of lacking compensation, especially in cases of mitral stenosis, have we the right to warn a woman against marriage. Marriage should be prohibited, or pregnancy prevented, when a woman, even with a compensated heart lesion, offers the symptoms of a tuberculosis or a chronic renal affection.

Nephritis. Girls suffering from a chronic nephritis should be strongly warned against marriage, especially in the presence of a complicating disease either of the heart or lungs. Married women must be warned against pregnancy or protected against a new impregnation. If a woman has suffered from an acute nephritis which, at the time of contemplated

marriage, has completely disappeared, she should be informed of the possibility or even probability of a return of this disease in case of pregnancy. In the married state, under the same conditions, impregnation should be avoided.

Syphilis. Women should be strictly prohibited from marrying while symptoms either of the primary or secondary state are manifest. A permission to marry may be given if the infection dates back more than 4 years; if proper antisyphilitic treatment has been administered in the meantime; and if the patient has been free from any syphilitic manifestations at least from 12 to 18 months. But even then no absolute assurance can be given that the syphilis will not show any untoward effect upon the offspring. It is probable that a syphilitic infection of the woman forever endangers progeny by a permanent influence of the syphilitic virus upon all the ova in the ovaries.

Epilepsy. The influence of pregnancy and epilepsy upon each other is but slight. Only the fact, that children of epileptics usually show some signs of degeneration and are extremely liable to develop the same disease, gives the physician a right to discourage epileptic women from marriage. In very aggravated forms of the disease marriage and impregnation should be prohibited.

Hysteria. What position should the physician take in the question of the marriage of the hysterical woman? Hippocrates was probably the first physician who considered marriage strictly indicated. Soranos of Ephesus, and many authorities since his time, have seriously objected to the Hippocratean mode of the therapy of hysteria, but it seems in vain. The Hippocratean idea is to-day still the most prevalent among the laity and is still applied by many physicians. If marriage in a certain case promises a distinct betterment of the patient's social and economic conditions and will offer her more suitable environments, then an improvement of the hysteria may be expected. But, unfortunately, the woman with pronounced symptoms of hysteria very often fails to prove a congenial mate and thus, as a rule, the influence of marriage upon hysteria is bad. In all exaggerated forms of the disease, especially if the mental symptoms are pronounced, marriage should be prohibited.

Psychoses. In all forms of incurable insanity marriage must be absolutely prohibited. In curable forms the advice always should be against marriage and pregnancy, since most of them have a distinct tendency to recur with pregnancy, usually during the puerperium.

THE CAUSATION OF OTOSCLEROSIS.

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The causation of the condition known as "otosclerosis" is obscure, but of late years a considerable amount of work, both in Great Britain and on the Continent, has led otologists to look upon the subject as one of wider significance than a mere local disease of the tympanum and labyrinthine capsule. To appreciate properly the pathogenesis of otosclerosis, therefore, it is necessary to give a brief review of the history of the work done, and to pass under notice the most recent researches of a somewhat large body of investigators.

The term "sclerosis" was first employed to denote a definite chronic affection of the organ of hearing by von Tröltsch. In his *Lehrbuch* that author differentiated the form of deafness from Eustachian catarrh, with its sequelæ in the tympanum, and, further, from true secretory catarrh of the tympanic cavity. He described the sclerosis of the middle ear tissues as a pathological process, producing thickening, rigidity and loss of elasticity in the tympanic mucosa, leading to changes in the tympanic membrane, the malleo-incudal articulation, and especially in the membranes of the fenestræ, the vibratory functions of which are much interfered with. Ultimately complete rigidity of the articulations of the auditory ossicles is produced, with immobility of the stapes in consequence of calcification and ossification of the annular ligament (synostosis stapedis).

Von Tröltsch fully recognized that this description was by no means a sufficiently clear explanation of the characteristics of the condition in question. He had expressed, more than 20 years previously, the opinion that a future increase of our knowledge of otosclerosis, founded upon anatomical observations, would give it a completely independent position in otology, an expectation which has been fully realized.

At the present time we understand by "otosclerosis" a group of cases in which, with patency of the Eustachian tubes, and a normal or approximately normal tympanic membrane, there is a progressive deafness characterized by definite symptoms on functional testing, and presenting the anatomico-pathological picture of bony ankylosis of the stapes in the fenestra ovalis, with or without a progressive spongioid process in the bony labyrinthine capsule.

The first observers to record the fact that deafness may result from

fixation of the stapes in its window, were Valsalva¹, Morgagni², and Meckel³. Until Toynbee published his "Descriptive Catalogue," in 1857, no further development took place. This work appears to have impelled others to research, and, in the thirty years which followed, further observations were published by von Erhard, Kramer, Voltolini, von Tröltsch, Politzer and others.

So far, investigation was confined to the recognition of stapes fixation as a cause of deafness, but, in 1861, a second epoch in the history of otosclerosis began by Moos's publication of a case in which he found ankylosis of the stapes without demonstrable change in the tympanic mucosa, and it was discovered that the condition was a primary circumscribed process in the bony labyrinthine capsule. The report of this case was followed by others until, in 1883, Bezold described the first case in which the accuracy of the diagnosis was verified by microscopic examination of the temporal bones and manometric tests of stapes mobility, at the same time laying the foundation of functional tests as aids to the detection of otosclerosis. Since that time the greatest part in the elucidation of the disease has been borne by Siebenmann⁴, Katz⁵, Bezold⁶, Scheibe⁷, Habermann⁸, Politzer⁹, and Denker¹⁰.

Nearly every otologist who has turned his attention to the elucidation of otosclerosis has endeavored to find a cause for the stapes ankylosis described. Lucae believed it to be due to chronic middle ear catarrh, Schwartze to hyperostosis following circumscribed periostitis ossificans, Moos to a primary ostitic process, Habermann and Katz considered its origin was to be found in an inflammation of the tympanic cavity. Scheibe⁷ brought forward two cases in which the typical changes of otosclerosis occurred after chronic suppuration and scarlatinal otitis respectively. In support of his opinion, Habermann pointed out that the foci of change tend to be grouped round the blood-vessels which pass inwards from the tympanic periosteum to the bone. The fact that there is very seldom any evidences of past or present tympanic inflammation, that foci may be met with at points quite remote from the tympanum, and that there are never any signs of bone inflammation, are strongly against these views.

Politzer¹¹ believes otosclerosis to be an osteitis, a contention negatived by the total absence of signs of bone inflammation, the sharp line of demarcation between the normal and newly formed spongioid bone, and the bilaterality of the disease.

Siebenmann⁴ has advanced a probable explanation, that it is the final stage of a developmental process, which does not normally take place in the petrous bone, but which is the rule in other bones. The bony labyrinthine capsule is remarkably rich in remnants of primary cartilage¹², that are to be found most frequently about the region of the pelvis ovalis, which is the seat of election of the changes in otosclerosis. In long and flat bones, growth, without change of shape, is brought about by a process of resorption and apposition after birth. The bony capsule of the labyrinth, however, attains its full size at birth, and the cartilage

remnants it contains are not, therefore, used up, so that, unless the normal development which Siebenmann considers as constituting otosclerosis takes place, they are retained in the capsule until old age. The chief objection to this otherwise plausible theory is that it in no way explains the involvement of the cartilage in the stapedio-vestibular symphysis. It is, however, supported by the hereditary nature of otosclerosis.

More recently, Albert Gray¹³, a distinguished British otologist, has advanced a valuable suggestion. He points out that otosclerosis is rare before puberty, almost uniformly bilateral, more common in women, hereditary, and that the following bodily conditions are recognized as favoring its development: Anemia, rheumatism, syphilis, pregnancy and gout, whilst its anatomical features are: Absorption of small portions of compact bone and cartilage over an area or areas marked off by a sharp line of demarcation, deposit of newly-formed spongy bone in this area, and finally the gradual formation of this spongy bone into compact bone. Where cartilage is destroyed, it is replaced by bone. Finally, there is never any trace of inflammation throughout the whole course of the condition. Reviewing these points, Gray suggests that the sharp line of demarcation between the areas of absorption and the healthy bone suggests death of the tissue in the area, and that the dead tissue is absorbed without the occurrence of infection. For reasons set forth in Gray's original paper, the circulation in the minute vessels of the bone is very apt to become sluggish, or to cease altogether for a time. Gray's suggestion explains certain peculiarities of otosclerosis; it accounts for the sharp line of demarcation between the new-formed spongy bone and the old compact bone, for the absence of signs of inflammation, and for the disappearance of the cartilage in the stapedio-vestibular symphysis.*

Escat¹⁴ sought to distinguish the part played by certain general conditions in the etiology of otosclerosis. Considering it as the consequence of a general toxemia, he based his theory (1) on the frequency of migraine in otosclerosis, (2) on the auto-toxic and auto-infectious origin of migraine, (3) on experimental researches relative to the trophic innervation of the ear by the trigeminal. On these principles, he defined otosclerosis as "the late anatomico-pathological substratum of a physiological trouble, of which migraine would be the primordial symptomatic expression." From the point of view of pathological physiology, the aural lesions resulted from functional disturbances of the bulbar centres of the trigeminal impregnated with toxic principles in circulation in the organism.

Following Escat's theory, Cornet¹⁵ has endeavored to show, from a complete examination of eighteen patients, that one can almost always demonstrate in otosclerotics the existence of an affection modifying in some way or other the normal function of nutrition. Eight of his patients were aged or arteriosclerotic subjects, so that there remained ten

*Gray's theory is supported by the researches of Gradenigo into the bacteriology of otosclerosis, which resulted negatively.

suffering from true otosclerosis. All of these showed the existence of various affections, entailing a chronic toxemia and determining sooner or later various organic alterations. The most frequent of these toxemias was gastro-intestinal intoxication. Cornet points out that there are no reasons why the ear, one of the most delicate and vulnerable organs of the economy, should enjoy an immunity in an organism impregnated with toxins, while the skin, mucous membranes, liver, kidneys, or nervous system are altered by degrees. The hypothesis accords, moreover, with our actual knowledge of otosclerosis, with its insidious onset in young subjects, apparently in good health, for chronic toxemias frequently remain latent; with its frequently hereditary character, for these toxemias are transmitted, and nothing prevents toxins attacking an ear rendered more vulnerable from the fact of aural attacks undergone by ancestors; with its frequent appearance during a pregnancy, being given the special changes of nutrition produced in the pregnant woman. The difficulty of admitting that an intoxication can transform a compact bone into spongy tissue is apparent rather than real, and Cornet instances the bone changes in rickets and in progressive deforming rheumatism as examples of what chronic toxemias can do.

It is convenient here to consider some of the phenomena of otosclerosis in regard to causation.

Age.—Otosclerosis essentially affects the young. It rarely commences before the twentieth year, although it has been known to do so. As a general rule, it occurs between 20 and 30 years, although instances have been met with in which it began between 30 and 40.

Sex.—Women are far more frequently affected than men. Taking ear diseases generally, Bezold's statistics show that men are attacked in 58 per cent., women in 42 per cent., whereas the percentage of the latter sex in otosclerosis is 61.2. Denker gives the relative percentage of men and women otosclerotics at 41.87 and 58.2. Hartmann found, in 33 cases, proved by post-mortem examination, 18 women to 15 men. Pierce¹⁶ found that women among his own cases were 60 per cent. In my own statistics¹⁷ the proportion of women to men is as 5 to 1.

Heredity.—In few morbid conditions has the influence of heredity been so conspicuous. To put it briefly, the percentages in which there was a distinct history of heredity are given, from actual cases, by Denker¹⁰, Bezold⁶, Pierce¹⁶ and Siebenmann⁴ as 40.5, 52, 71 and 35 respectively. Körner¹⁸, in 43 cases, found heredity apparently absent in only 7, and he believes that every case is really inherited. I would recommend the perusal of Körner's paper to all who are interested in otosclerosis. Hammerschlag¹⁹ has given two remarkable family trees, in which the history shows that the condition always originated from the female side.

The remarkable facts as to heredity give decided support to the theories of Gray¹³, Escat¹⁴, and Cornet¹⁵.

Like many other obscure conditions, a large number of exciting causes have been catalogued as giving rise to otosclerosis. Chief among

them are gout, rheumatism, syphilis, anemia, pregnancy and the puerperium and severe chill. When we consider that all of these may give rise to conditions favoring the establishment of a chronic toxemia, they need no further consideration. An exception must, however, be made in favor of syphilis.

The strongest advocate of the syphilitic origin of otosclerosis is Habermann⁸. He pointed out the coincidence of the time of life at which the condition begins and that in which syphilis is most frequently acquired, and he considers that there is a similarity between the histology of the labyrinthine rarefaction and syphilitic and parasymphilitic osteitis. The long duration, the subsequence of active foci, the formation of spongy hyperostosis and exostosis, the resorption of old bone and the reposition of new, as found in otosclerosis, have their analogues in syphilitic osteitis. The absence of caries and necrosis in otosclerosis is an obvious stumbling-block to Habermann's view, which he endeavors to explain away by attributing a diminished virulence to the syphilitic virus, calling in support the observations of Volkmann and Salowitschik, that even osseous gumma undergoes necrosis only under unfavorable conditions.

Habermann's theory is, however, untenable. All otologists who have had much experience of syphilitic disease of the ear, both congenital and acquired, are well acquainted with its characteristics. Moreover, men are much more often attacked by syphilis than women, whereas the reverse is decidedly the case with otosclerosis. To these objections I would add that otosclerosis is not in the least amenable to anti-symphilitic treatment and, were it due to the congenital form of the disease, there would be ample evidence of the fact by the association of such other well-known signs as interstitial keratitis, Hutchinson teeth, etc., signs which I have never met with in otosclerosis. Lastly, the result of Wassermann's serum test has proved to be entirely negative in all the cases of otosclerosis submitted to it²⁰.

I have now reviewed briefly the results of the investigations of leading otologists into the pathogenesis of otosclerosis. These investigations point strongly to four conclusions:

1. That it is due to the local manifestation of what is probably a general condition.
2. That that general condition is of the nature of a chronic toxemia, in many cases of an intestinal origin.
3. That heredity plays a prominent part in its determination.
4. That syphilis cannot be considered to have any direct relation to it.

Otosclerosis is a condition the elucidation of which requires co-operative investigation by the otologist, the physician, and the organic chemist.

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UNCINARIASIS.

By WILLIAM WESTON, M. D., of Columbia, S. C.

Uncinariasis has been known by many names, in fact in each country and in each community where it occurs it is known by a different name. In Egypt it was known as Egyptian chlorosis, in Europe as St. Gothard's disease, in America as Dirteater's anemia and Negro consumption. In the South the people infected have been called by various names, generally conferred by their negro neighbors, denoting contempt. Some of the names that I recall are "Poor Buckra," "Sand Hillers," "Crackers," "Sandlappers," "Shad Bellies," etc.

History: In 1873 there came into possession of Prof. Ebers at Thebes a papyrus dated 3,500 years ago, and which has been translated into German. It is quite evident from the description of the disease, called A. A. A. and U. H. A., that it was nothing more than what we recognize at this time as uncinariasis. In this papyrus is also recommended a remedy, but evidently those in authority were not aware of the causative agent.

The disease was discovered in Brazil in 1684, and a number of years later in the West Indies. In 1782 a German clergyman named Goeze, while dissecting a badger found a small worm in the intestine which, from the hooklike caudal extremity of the male worm, he named "der haar-rund Wurm" (the hair-round worm). In 1789 Froelich found a similar worm in the intestine of a fox and he named it "haaken Wurm" or hook-worm. In 1843 Dubini published an account of the disease, described the parasite and named it *ankylostomum duodenale*. Evidently Dubini's work stimulated research, because shortly afterward there were numerous cases reported from various parts of the world.

In 1879 a very serious disease broke out among the laborers in the St. Gothard's tunnel. The chief symptom was anemia. Upon investigation it was found that the disease was the same as that described by Dubini, and the causative agent was the same.

In 1808 Dr. Pitt, of North Carolina, wrote an article describing a disease occurring along the Roanoke river, in which anemia and dirt-eating were common among the poor white people and the negroes. Similar symptoms were described in various sections of the South by different observers, notably Chabert in Louisiana, Little in Florida, Le Conte in Georgia, Lyell in Alabama, and Geddings in South Carolina.

So far as I can learn the first American to describe the disease and find the causative agent was Dr. Allen J. Smith, then of Galveston, Texas. This was in 1893.

In 1902 Dr. C. W. Stiles at Washington, D. C., discovered that the

disease as it existed in America was due to an entirely different worm from the Old World hookworm, and this new worm he named *Necator Americanus* (American murderer) or *Uncinaria Americanus*. Since then Dr. Stiles has had a great deal of experience with the disease, and to his work and publications upon the subject is largely due the widespread interest now being manifested.

To one of Dr. Stiles' former students, Dr. Bailey K. Ashford of the U. S. Army Medical Corps, is due great credit for his valuable work on *Uncinariasis* in 1900 in Porto Rico. As a result of the knowledge gained by his work the mortality rate in Porto Rico has been reduced at least 30 per cent., and the prosperity of the island greatly stimulated.

To Dr. Arthur Looss we owe our present knowledge of the life history of the worm, and in fact practically all that is known of the worm is due to his studies on the subject in Egypt.

Definition: *Uncinariasis* is an insidious disease characterized by progressive anemia, wasting and loss of strength, in the young by retardation or arrest of development, and is caused by a specific parasite, *Uncinaria Americana*, which attaches itself to the mucous membrane of the small intestine of the human being.

Description: The worm is cylindrical in shape, somewhat attenuated anteriorly. The buccal capsule, or mouth, has a dorsal pair of semilunar shaped plates, and a dorsal conical shaped medium fang extending from along the oesophagus into the mouth. Through this fang is secreted a poison, the nature of which is not definitely known.

Guarding the oesophagus is a set of teeth which grasps the mucosa after it has been drawn down by the semilunar shaped plates. The worm is perfectly visible to the naked eye, being from $\frac{1}{4}$ to $\frac{1}{2}$ inch long. The female worm is slightly larger than the male.

Geographical Distribution: In the United States the disease is widely spread over the mountain and sand regions of the Southern States. It is also found in Cuba, Porto Rico, the West Indies, Mexico, South America, the West Coast of Africa, and as far towards the interior as where the Pygmies live. In short, the disease exists wherever slaves were carried from the West Coast of Africa, and climatic and soil conditions were suitable for the preservation and spread of the worm.

Life History: The eggs of the worm are layed in the intestines, and are discharged with the feces. In the open air, if the weather is warm, the eggs hatch in from 24 to 48 hours, and the embryos escape. In this stage the embryo feeds upon the feces, and grows, and during this stage sheds its first skin. After 4 or 5 days the larva grows another skin under the old one, and the old skin rises up, but is not shed immediately. The larva grows freely in this skin. In this stage certain anatomical changes take place, and the little worm grows much thinner. After these changes the worm takes no more food until it enters the human body. When it enters the skin of the human being it escapes from the old skin, which remains outside and has the appear-

ance of a sheath. It takes about 71 days from the time the worm enters the body until eggs can be found in the feces.

Mode of Infection: Infection takes place in two ways, by the mouth and through the skin. When by the mouth it is from eating uncooked vegetables that have come in contact with infected earth, or by putting the fingers in the mouth after handling infected earth. In the light of present knowledge the entrance through the mouth seems exceptional. In the several hundred cases that have come under my care, almost without exception the history of the cases showed that infection took place through the skin.

The discovery in 1901 by Dr. Arthur Looss of the fact that the larvæ enter the human body through the skin was purely accidental, and the story as told me by Dr. William S. Symmers, now pathologist at Queen's College, Belfast, but then pathologist at the Kasr-el-Ainy Hospital, Cairo, Egypt, and in whose laboratory Dr. Looss was temporarily working, was most interesting, and I shall relate it as Dr. Symmers told it to me. It seems that one day Dr. Looss was feeding some puppies with milk heavily infected with larvæ and a drop fell in the cleft between two of the fingers of his left hand. Soon he found that where the milk was dropped the spot had become red and was burning and itching. He wondered if this could be caused by the larvæ. He then allowed another drop to fall upon his hand in a different place, and again the same symptoms appeared. Some minutes afterwards a microscopic examination was made of the drop and it was found that only a few sluggish worms remained, and that there were present countless sheaths from which the larvæ had escaped. Subsequent examinations proved that while the puppies who had fed upon the infected milk had escaped infection, Dr. Looss had not been so fortunate.

Dr. Looss, in order to verify this observation, soon found a boy whose leg was to be amputated. An hour before the amputation he thoroughly cleansed the leg with soap and water and then dried it. Then 1 drop of water containing many larvæ was dropped on a spot and left to dry. After the amputation a section was made of the skin upon which the drop had fallen, and on examination it was found that as far as the drop had spread not a hair follicle was free from the young worms, and many of the follicles contained masses of them in all stages of entry. The same experiment has been made upon dogs with the same result as with human beings. Since then many have confirmed Dr. Looss' observations, and to-day, while the observation seemed incredible, its truth has been abundantly proved.

Dr. Looss has also demonstrated by most interesting experiments that after the worms have forced themselves through the skin they reach the lymph vessels and then pass into the cutaneous veins. They are then carried by the blood current into the right side of the heart, and from there to the air cells; then through the bronchi, trachea, larynx and oesophagus and stomach on into the small intestine. Some, however, reach the heart

through the thoracic duct. After reaching the intestine they shed their skins twice again, and then become attached to the intestinal wall, where they do their injury by lacerating the intestinal mucosa, sucking the blood, and by injecting a poison.

Predisposing Causes: Both races in this country are equally susceptible, but the negro who has been infected for centuries seems almost immune to its effects. Mulattoes are much more inclined to show serious results of infection, and seem to have little power of resistance.

Age: Age is an important consideration. While it is true that infection takes place at any age, equally quickly, by far the greater number of infections takes place among children, since it is the custom in the South, among all classes, for children to go barefooted in warm weather.

Occupation: Anyone who works in infected soil is apt to have the disease; therefore, brickmakers, pottery workers, miners, and farmers are especially largely represented among infected subjects.

Sex: In children sex is not a consideration, but as males are more exposed to infection, naturally more of that sex have the disease.

Season: By far the greatest number of infections takes place in the spring and autumn.

Symptoms: When a case is presented for examination the first symptom apparent is anemia, which is present from a slight to a profound degree, depending upon the length or severity of infection or both. The heart's action is weak and often irregular. Hemic murmurs are not unusual, and often lead to an incorrect diagnosis. The red cells are much reduced, and hemoglobin is low. The white cells are slightly increased, and eosinophils are frequently much increased. This, however, leads often to an incorrect diagnosis, as sometimes the severest infection will not show an increase of eosinophils.

The conjunctivæ are pearly white, and the cornea has a glassy appearance. The skin is dry, harsh and frequently almost lemon- or brown-colored. The face has a stupid, listless and anxious expression.

Neuralgic pains about the head and face are usual, and there generally exists a marked tenderness in the epigastrium, and often a gnawing pain in that region is complained of. The appetite is usually perverted. Infected subjects are almost always fond of pickles, which they greedily eat by the bottle. Lemons are another favorite article of diet. Dirt-eating is not unusual, and it should be remembered that this is a result and not a cause of the disease.

The bowels may be either constipated or diarrhea may exist. Edema of the entire body may, and often does exist. Lack of energy and sleepiness are almost constantly present. Debility, wasting, and in the young, retardation or arrested development, are the usual symptoms. Uncinariasis in the South constitutes the chief cause of backwardness in the mental development of school children.

In women the breasts are poorly developed, and scanty and painful menstruation is the rule. Often complete suppression of the menses will

occur. Abortions frequently occur. It is not unusual to find the hair absent from the armpits and over the pubes in both sexes where infection has taken place before puberty. Sandwith says impotence was complete in 63 per cent. of his cases, and partially so in 13 per cent.

I have frequently attended patients that would run, for from 8 to 10 days, a typical typhoid temperature with abdominal distention, and suddenly the fever would cease. In these cases I have almost always been able to find hookworm-eggs in the feces.

Diagnosis: The only positive means of proving the existence of the disease is by finding the eggs in the feces.

Prognosis: Generally favorable if treated early, but if neglected the disease so reduces the physical resistance that intercurrent diseases generally prove fatal.

Prevention: Treat all cases and prevent soil pollution.

Treatment: The night before commencing treatment allow no supper, and give $\frac{1}{2}$ ounce of epsom salts. Early the next morning, in a fairly strong adult, give 6 capsules containing 5 grains of thymol, and in 2 hours repeat the above amount. Follow in 2 hours with $\frac{1}{2}$ ounce epsom salts. Allow no food from the time the first dose of salts is given until the last dose acts. During the first day of treatment allow no alcohol or fats to be taken.

Doses of thymol for children:—

From 5 to 8 years.....	10 grains
From 8 to 10 years.....	20 grains
From 10 to 12 years.....	30 grains
From 12 to 14 years.....	40 grains
From 14 years up.....	60 grains

It is usually necessary to repeat the thymol once a week for 3 weeks to eliminate all the worms.

Invariably begin with Bland's pills the day following the thymol.

General Considerations: I believe hookworm disease in the Appalachian and sandy districts of the South constitutes the most serious menace to life, happiness and industrial prosperity of any single or combined agency that exists.

It is evident in the schools, where it is the chief cause in the production of the laggard. In 90 per cent. of the cases it is the cause of the Cotton Mill anemia. It is the chief cause of the abandoned fields, so evident in the South; it is the chief reason why in large districts of the South manufacturing has not proved successful; and the victims of this disease are, because of their ignorance and prejudice, the chief support of the demagogism with which the South is so seriously cursed.

A CASE OF RENAL CALCULUS AND REMARKS ON
OXALURIA.*

By G. BAUMGARTEN, M. D., of St. Louis.

The remarks which I purpose to make on the subject of oxaluria are called forth by the following case. The patient is Mr. S., aged 35, married, of average height and frame, not very robust looking, and he lives in a suburb. He had had scarlet fever at the age of 5, and typhoid fever, a severe attack, in 1890 (at the age of 22).

He first called on me October 27th, 1903. A year before he had suffered repeatedly from pain in the right lumbar region, for which the physician (in Alleghany, Pa.), ordered some tablets and hot water bottles. Since that time, the patient's father, who is a physician, gave him "uron" (which is known to be a mixture of urotropine and lithium benzoate).

Lately he has frequently had some pain in the back, and always, after an attack of pain, has passed some specks of blood in the urine. Walking or other exertion is likely to bring on the pain. Some days he has had no pain, but of late it has always been a comfort to him to lean his back against something, or to support himself—*i. e.*, press upon the area of pain. His present physician gave him, among other things, morphine, lithia, and Vichy water.

The urine on this day, October 27th, 1903, was highly colored, turbid, neutral, sp. gr. 1025, contained some albumin, microscopic masses of pus, many red corpuscles, no casts.

October 29th, 1903, he reported that pain occurred sometime every day, especially while riding in a street car, or while jolted in a carriage. The right kidney was sensitive to pressure; there was also tenderness in the course of the right ureter. His appetite was fairly good, but he ate no meat, following his physician's order. He had some tendency to constipation, and had lost 6 pounds of his usual weight (142 pounds).

The urine, on October 27th, was lighter, still turbid, freely acid, sp. gr. 1021, contained less albumin, little pus, and microscopically large caseous masses covered with red blood corpuscles. There were no casts.

During November and December, 1903, the urine remained of much the same character; sometimes it was slightly bloody, and always contained small amounts of pus; also crystals of calcium oxalate, which sometimes became very abundant and which often were of large size even in the fresh urine. They disappeared in December, but reappeared in January, 1904. The general condition and the behavior of the pain remained the same.

*Read before the St. Louis Society of Internal Medicine, February 17, 1910.

On January 28th I made a positive diagnosis of pyelitis or pyelonephritis from a calculus, probably of calcium oxalate in the right kidney or pelvis, and advised a surgical operation. An *x*-ray picture taken early in February by Dr. M. B. Clopton gave no result, however. Extraneous circumstances hindered the patient from making up his mind to undergo the operation.

February 23rd, 1904, patient passed a specimen of urine under circumstances that made it probable that the right ureter was temporarily closed. This specimen was rather pale, clear, very freely acid, sp. gr. 1015, contained but a doubtful trace of albumin, and made no sediment.

April 20th, after an attack of renal colic, he passed a very small cal-

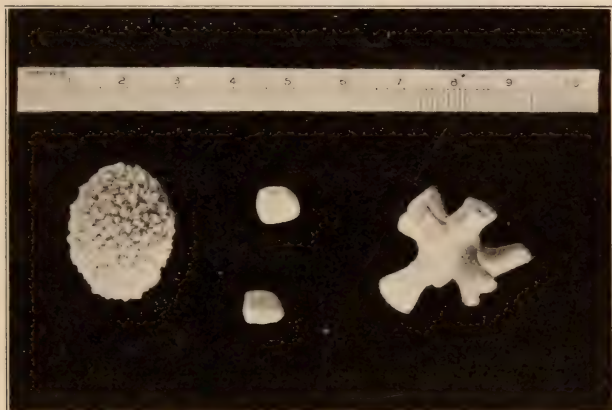


Fig. B.—Stones removed from right kidney,—*a* June, 1904, *b* July, 1908.—[One of the smaller pictures is that of one of the prongs of the stone *b*, broken off.]

cium oxalate calculus. On the following days the urine was again a trifle bloody.

In May, Dr. Clopton took another *x*-ray picture, which now showed a distinct shadow in the right kidney. The indication for operation now became so positive, that the patient consented, and on June 4th, Dr. Harvey G. Mudd removed from the pelvis of the right kidney a large amber-colored "mulberry" calculus bristling with sharp crystals; its largest diameter was 15/16 inch.

Convalescence from the operation was uninterrupted and complete. The pain ceased. On June 21st a normal urine was passed, without albumin, without calcium oxalate, and with only a few pus-cells.

In August and September, 1904, Mr. S. had several paroxysms of acute malarial fever.

In May, 1906, he went through a period of dyspeptic troubles, with dizziness, headache, and depression, from which he recovered perfectly under treatment.

In 1905, and in January, 1907, several specimens of urine were found normal, in particular free from albumin, pus, blood, and calcium oxalate.

In November and December, 1907, the patient's health was not so good, and the urine, always acid in reaction, again contained traces of albumin, some mucus, a few pus-cells, and again calcium oxalate; and on December 2nd also a few red blood corpuscles. He also complained of some vague aching in the back.

In May, 1908, these complaints had increased and interfered somewhat with his work. May 30th the acid urine contained a bare trace of albumin, some discrete pus-cells, no red corpuscles, no casts, but a small amorphous deposit of earthy phosphates. Two days later, the somewhat larger white powdery sediment consisted chiefly of calcium oxalate and pus-cells; there was found a group of several large and many small crystals coherent; also one very large crystal, at least 6 times the diameter of a pus-cell.

In June a radiogram taken by Dr. Carman showed a very distinct shadow in the right kidney, which made a plain indication for a second operation. This was performed by Dr. Mudd, on July 3rd, 1908, and two calculi were removed; a small, roundish one and a large coral-shaped one, which had thrown the peculiarly branched shadow in the x-ray picture. The surface of both stones was dull, not crystalline, and of a light buff color; very different indeed from the former stone. On mere inspection they were supposed to be uratic concretions, for they differed materially in appearance from the usual oxalate stone. But when I examined them I found them very hard, and a portion of the smaller one gave no uric acid (*i. e.*, murexid) reaction, but proved to contain both calcium and oxalic acid.

For about 2 weeks after the operation, the urine contained so large an amount of blood that further examination was nearly impossible, but on July 17th it contained but little blood, and the sediment after 24 hours consisted of crystals of ammonium urate and calcium phosphate, but no oxalate. By July 21st it was free from blood; it contained only a few leucocytes, and no albumin. Specimens in August and October were normal, the last specimen very dilute under the influence of Mountain Valley water. The patient has remained well up to date.

This case suggests two trains of thought: one on renal calculus, the other on oxaluria.

The diagnosis of a renal calculus has recently been rendered very certain by the improved technique of radiography. The clinical features upon which we rely, in addition to the examination of the urine, do not in all cases enable us to make a positive diagnosis, although in the case I have related no doubt was possible. The history of pain, almost constant in the region of the right kidney; the tenderness on pressure in the

same spot, never changing location; the constant occurrence of a small amount of pus, and the very frequent presence of microscopic amounts of blood; the occasional hematuria, always setting in at times when the pain was increased, as by unusual exertions or by jolting in carriage or street car;—these things made a very distinct and suggestive clinical picture. The very frequent, almost constant, presence of calcium oxalate crystals in the urine which was invariably acid; the finding of aggregations of these crystals in larger groups (which is rare), and finally the

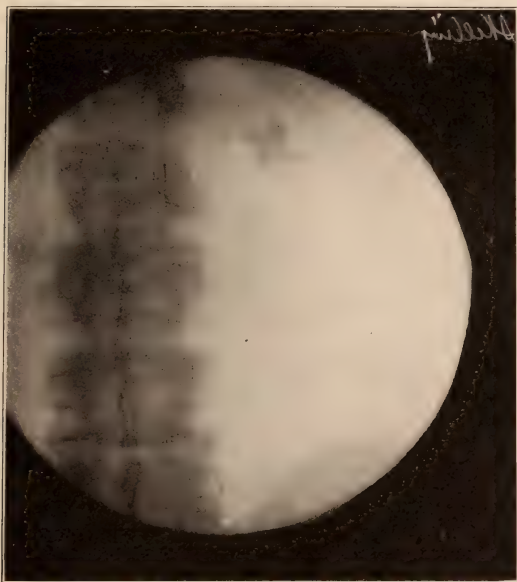


Fig. A.—Shadows in region of right kidney. Picture taken in June, 1908.

passage of a small oxalate stone after a distinct attack of renal colic with bloody urine, left no doubt as to the chemical nature of the calculus. Moreover, the character and sequence of the symptoms agreed best with the supposed oxalate calculus. So that my confidence in the diagnosis was not shaken when the first *x*-ray examination failed to confirm it. It was therefore a great satisfaction, and a clear indication for the surgeon, when a second attempt showed the shadow in the right kidney. At present the technical methods of radiography have so far

improved, that "a renal calculus must invariably show" (Carman, *Journ. Mo. State Med. Assoc.*, May, 1908), as was beautifully illustrated four years later by the picture taken in June, 1908.

As to the treatment of renal calculus, "the mere presence of a stone in the kidney is indication for operation" (M. W. Richardson).

The case before us has also aroused in me new interest in the pathology and treatment of oxaluria. The incidence of oxaluria has long been noted in association with dyspeptic and neurasthenic conditions. The latter term, however, does not cover the ground; it is not only in the neurasthenic but also in the brain worker that we meet it. The latter engages at times in an excess of mental labor, and the worry and excitement of the professional or business man will have the same effect, as the nervous overwork of the neurasthenic, who works his nervous system in a wasteful manner and in unprofitable measure. My patient was not a neurasthenic, but an arduous professional man who, as I learned from other sources, worked overtime. He was also subject to mild dyspeptic disorders, possibly to occasional intestinal autointoxications.

Many authors incline to the opinion that the stone-formation has its first beginning in an infection of the pelvis of the kidney. They consider pyelitis as the primary factor, the precipitation of the calculous material taking place around a nucleus of mucus or pus, or a clump of bacteria, as the bacillus coli communis. I do not consider this necessary in every case; a lump of mucus, a group of epithelial cells shed from the normal lining of the pelvis, is quite sufficient as a nucleus, at least for calcium oxalate.

The source of the oxalic acid is the more interesting question. In health the great bulk of the oxalic acid is certainly derived from the food. Persons, who eat freely of rhubarb, spinach, tomatoes, and other vegetables that contain larger amounts of oxalic acid, are quite liable to excrete calcium oxalate in the urine, and it has been repeatedly shown that a person affected with this alimentary form of oxaluria can be freed from it in a few days, under an exclusive milk or milk-and-bread diet. It was argued from this that oxalic acid was not formed in the body as a product of metabolism. This may be true in ordinary conditions of health, but to say that it *cannot* be formed in the animal body is too sweeping a conclusion. Two patients, with nervous depression and some digestive disturbances, were observed in Herter's laboratory by Dr. Helen Baldwin, in whom oxaluria did *not* disappear on a diet free from oxalic acid (*Trans. Assoc. Amer. Phys.* XV. 50). In connection with these studies, Dr. Baldwin succeeded in producing oxaluria experimentally in dogs. The animals were fed on sugar: glucose or saccharose. This diet finally produced excessive fermentations and a distinct gastritis with absence of hydrochloric acid, and the urine contained an abundant precipitate of calcium oxalate crystals. Since the oxalic acid in these cases was not introduced with the food, it must have been formed in the stomach of the animal. For "the gastric contents then contained oxalic acid, and

it was possible in some instances to induce a considerable production of oxalic acid by inoculating a medium of sugar and albumoses with material from the gastric contents" (Herter, *Chemical Pathology*, 194).

Herter seems to believe that the oxalic acid is derived from carbohydrate fermentations in the stomach favored by the absence of hydrochloric acid, "perhaps the presence of a small amount of proteid is also necessary" (*Ibid.* 195). Others consider that its immediate mother-substance is glyccoll, a derivative from the gluten or gelatin of the connective tissue substances, possibly also from proteid substances under conditions of abnormal fermentations. Very minute amounts may thus be formed in health. But even the minutest quantities may become of importance, being excreted chiefly by the kidneys, and always as calcium oxalate, which is absolutely insoluble in water. In the urine the oxalate is soluble to a small extent in the presence of acid sodium phosphate. Hence, the more acid the urine, the more soluble, *i. e.*, the less liable to crystallize out is the calcium oxalate. Moreover, it is the more soluble, the greater the content of magnesium salts, and the less the proportion of calcium salts (Klemperer, *Deutsche Klinik*, IV. 3, 249). The knowledge of these things is likely to be important in the treatment of oxaluria.

Commonly we measure the oxaluria by the amount of calcium oxalate, which is spontaneously deposited in crystalline sediment; it is this alone that causes subsequent danger to the patient by its mechanical effect, and calls for treatment, or rather prophylaxis.

Apart from the treatment of nervous conditions, of digestive disturbances, and the care of normal gastric functions, the prevention of oxaluria is a matter of diet. Animal food should prevail over vegetable food. With preponderating meat food more hydrochloric acid is secreted by the stomach, there is less opportunity for the formation of oxalic acid, and the urine becomes more acid; hence the oxalates are more easily kept in solution. Moreover, animal food is rich in magnesium, poor in calcium, excepting milk and eggs, which are rich in calcium but poor in magnesium. If experience has shown (Tyson, *Trans. Assoc. Am. Physicians*, XV. 51) the utility of a milk diet, it is because of its beneficial influence on the gastric functions, and because a pure milk diet is usually a starvation diet, and lastly because it may have a diuretic effect. But increased diuresis opposes the formation of renal calculus. Hence even the mild alkaline tablewaters may be useful, provided they are drunk, as Klemperer directs, during and immediately after meals.

The dietetic directions then should be: favor a meat diet, let milk and eggs be used sparingly. Forbid those vegetables which contain larger amounts of oxalates altogether, especially spinach, rhubarb, cocoa and tea. Let the patient avoid excess of sugar, of nuts, and of dishes likely to induce unusual fermentations. Some fruits—apples, pears and plums—are recommended because they are relatively rich in magnesium salts.

Drugs are superfluous. Klemperer (*Deutsche Klinik*, IV. 3, 256), ad-

vises, when it becomes necessary to abate the oxaluria rapidly, the administering of small doses of magnesium sulphate frequently.

To return to our case, I must not omit to advert to another point of interest: the recurrence of stones of the same chemical character in the same kidney after surgical removal of the first. Such a recurrence is fortunately rare. When, after the removal of the calculus, a pyelitis continues, it may well happen that a phosphatic calculus is formed, but even this is not often the case. I cannot help thinking, that if it had been possible after the first operation to institute and carry out for years the regimen outlined, the patient might have been spared the severe ordeal of the second nephrotomy.

MEDICAL AND SURGICAL PROGRESS.

MEDICATION AFFECTING THE BLOOD PRESSURE.

A REVIEW OF RECENT LITERATURE.

By WILLIAM ENGELBACH, M. D.

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2. VASODILATORS IN HIGH BLOOD PRESSURE.—Matthew (*Quart. Jour. Med.*, 1909, ii., 261).
3. THE BLOOD-PRESSURE-RAISING SUBSTANCE OF THE KIDNEY.—A. Bingel and E. Strauss (*Deut. Archiv. f. klin. Med.*, 1909, xcvi., 476).
4. THE LOWERING OF BLOOD PRESSURE BY THE NITRITE GROUP.—Wallace and Ringer (*Jour. Amer. Med. Assoc.*, 1909, xx., 1629).
5. A STUDY OF THE MECHANICAL FACTORS IN EXPERIMENTAL ACUTE PULMONARY EDEMA.—Miller and Matthews (*Archives of Int. Med.*, October 15, 1909).
6. THE EFFECTS OF PROLONGED ADRENALIN MEDICATION ON THE HUMAN CIRCULATORY ORGANS.—Brooks and Kaplan (*Archives of Int. Med.*, October 15, 1909).

H. C. Thatcher has possibly explained the rather paradoxical findings of Lowi, who showed that in states of cardiac decompensation, when the venous system was greatly engorged, the arterial pressure might even be raised. Thatcher's experiments consisted in determining the changes of volume of the various organs by means of an oncometer when sudden cardiac insufficiency was produced. The condition was produced by means of a small balloon introduced through the right jugular vein in a collapsed condition into the right auricle or inferior vena cava. By sudden dilatation of the balloon almost complete block of the returning venous blood was effected. Enormous engorgement of the liver at once followed. The liver was found capable of extending to such a degree that a quantity of blood, amounting to from $\frac{1}{3}$ to $\frac{1}{4}$ of its own weight, could be accommodated. The brain also showed a considerable increase in volume, but not so marked as the liver. The spleen, intestines, kidneys, and extremities, on the other hand, all showed a distinct decrease in volume. More complete investigation of the kidney indicated that with this organ the decrease in size was due to a contraction of the arteries, following the arterial anemia resulting from the venous block. This arterial contraction was so great that notwithstanding the venous engorgement of the organ its volume was diminished. The brain

and liver, organs which are well known to have weak vasomotor mechanisms, followed the curve of the venous pressure; whereas, the kidney, spleen, intestines, and extremities, with their active vasomotor apparatus, adapted themselves to the sudden arterial anemia by means of powerful vasoconstriction. The nervous control of this action, Thatcher believes to be largely central, because when the nerves of one kidney were cut the organ did not contract as markedly as its fellow. Blood pressure curves were made with all the experiments, and were of great interest. With the first shock of shutting the right heart the systemic pressure fell abruptly. But very soon it rose rather rapidly, and reached a level somewhat lower than the original. This was held as long as the right heart was blocked. Evidently, then, the organs with powerful vasomotor mechanism, by their arterial constriction, served to bring up the following pressure and maintain it at a life-sustaining level. In conclusion, Thatcher points out that the artificial nature of the lesion does not simulate absolutely the acute cardiac insufficiency of man, nor does it have any bearing on the chronic venous congestion of old weak hearts. But his experiments indicate what an important role the vasomotor mechanism plays in the pathology of circulation.

Matthew states that it has to be recognized that high blood pressure is not necessarily harmful to the individual. In some cases it is to be considered as purely compensatory; therefore, not every case of high blood pressure should be treated with vasodilators. Undoubtedly there is a tendency for the blood pressure to increase progressively, and our aim should be to prevent this increase from being too sudden and exaggerated. Matthew has studied the action of the vasodilators in patients with hypertension by means of the sphygmomanometer. Nitroglycerin, potassium and sodium nitrites, erythrol tetranitrate, and mannitol hexanitrate all showed a powerful vasodilator action, while cobalto-nitrate of potassium proved inert in this regard. Not all cases of hypertension, however, responded with a fall in blood pressure. The nitrites produced little or no vasodilator action in certain cases. Moreover, a rise in blood pressure occurred in some cases of advanced Bright's disease. In heart and kidney disease, when there is edema, nitrites do not act well. After the edema has disappeared the usual vasodilator action may reappear. He made observations in many cases of hyperextension when symptoms had developed, such as pain, headache, giddiness, epistaxis, etc. He invariably found that such symptoms were alleviated or that they disappeared entirely with a reduction of pressure amounting to about 30 mm. Hg. Furthermore, he observed that, if this fall could be maintained the symptoms did not reappear, and the patient's general condition improved. Matthew then determined the dose of various vasodilators that would produce and maintain such a reduction. Liquor trinitrine (nitroglycerin), in the dose of 2 minims, lowered the blood pressure 20 to 30 mm. Hg. very temporarily. Following this transient lowering there was an almost immediate gradual rise of the pressure, and in all cases the effect of the drug passed off in 30 minutes. Sodium or potassium nitrite in doses of 2 grains produced a reduction of just over 30 mm. Hg. This action will last 2 hours and only after this, is it necessary to repeat the dose. No benefit is obtained by increasing the dose, and a less dose will not give the desired result. Erythrol nitrate in the dose of 0.5 to 1 grain will produce the beneficial reduction, and the effect will last about 6 hours. Matthew found that erythrol nitrate sometimes caused unpleasant symptoms, and recommends the smaller initial dose as safer. Mannitol nitrate acts similarly to erythrol nitrate in doses of 1 grain. Its maximum effect

is attained more slowly than erythrol nitrate, and therefore it is probably safer. Matthew concludes by saying that the useful and suitable dose of a nitrite for each individual can readily be ascertained by noting the effect of the nitrite as to the amount of fall produced, and the time the action lasts.

A. Bingel and E. Strauss report their careful observations on the blood-pressure-raising substance in the kidney in an interesting article. Tigerstedt and Bergman had previously shown the presence of a substance in watery extracts of rabbits' kidneys called rennin, which, when injected into rabbits, had a distinct blood-pressure-raising effect. Bingel and Strauss in their experiments used the pressed juice of fresh kidneys. Only the cortex was employed, the pyramids being cut away and all blood washed out. The present investigation was carried out chiefly with extracts of pigs' kidneys, for Bingel and Strauss had previously shown that the extracts from kidneys of all large animals possessed the same effect, when injected into rabbits, as the extract from the kidneys of rabbits themselves. Tests were made with the juices of many other organs, but all save the hypophysis cerebri and adrenal gave depressor effects. The pancreas was especially noticeable in this respect. The action of the kidney juice was very powerful, for it produced a rise in pressure of from 40 to 60 mm. Hg. This lasted from $\frac{1}{4}$ to $\frac{1}{2}$ hour, and the descent was slow. Bingel and Strauss, moreover, were able to separate the active principle, which they call rennin, from the kidney extracts. Among other qualities they state that the activity of the substance is destroyed by heating to 58° C. and by the action of acids, alkalies, alcohol, and acetone. Physiologically it has precisely the same action as the whole kidney juice. After injection the effect is not immediate, but appears in about $\frac{1}{4}$ of a minute. The rise in pressure is not extremely rapid, for it takes from 1 to 2 minutes to reach the highest point. The height is maintained for variable lengths of time and then there follows a gradual sinking in pressure. This decline usually requires from $\frac{1}{2}$ to $\frac{3}{4}$ of an hour. The maximum rise recorded in any of their experiments was 70 mm. Hg. A comparison of the action of rennin with that of adrenalin indicates that the former causes a much less sharp rise of pressure and permits a slower fall. Repeated injections of rennin produce progressively less effect, until finally there is no response. But this is not because the animal's blood-pressure-raising capacity is lost, for when an injection of adrenalin is made after a series of rennin injections lasting 2 hours, the substance again provokes a rise of pressure. A curious phenomenon was noted when an animal was first injected with the juice of other organs and then given rennin. No rise in pressure occurred. Cutting off the nerve control of the vascular system did not check the action of rennin, for like that of adrenalin, it is exerted on the muscles of the peripheral vessels. They further suggest the possible significance of rennin in connection with the high arterial tension of kidney disease, especially with the sclerotic type of kidney.

Wallace and Ringer have made some observations in order to determine the comparative effect of the most common drugs of the nitrite group upon the blood pressure of normal individuals and of patients with arteriosclerosis. In order to obtain uniformity of results they gave amyl nitrite in dosage of 3 minims by inhalation; nitroglycerin, 1.5 minims of a 1 per cent. solution; sodium nitrite, 1 grain in solution; and erythrol tetranitrate, 1.5 grains in chocolate tablets. The latter three were given by the stomach. All these drugs, in the doses above given, seem to cause the same fall of blood pressure in normal individuals. The chief

difference in their action lay in the rapidity and the duration of the fall of blood pressure. They found that the action of amyl nitrite began within 1 minute and was over within 7 minutes; that of nitroglycerin began within 2 minutes, and was over within 30 minutes; that of sodium nitrate began within 10 minutes, and was over within 1 hour; that of erythrol tetranitrate began within 15 minutes and was over within 2 to 4 hours. In general they found that the higher the initial pressure, the greater was the actual fall. Increase in dosage produced an increase in degree and duration of the action which is, as a rule, fairly proportional to the dose. In studying the effects on abnormally high blood pressures they took patients suffering from arteriosclerosis with pressures varying from 172 to 256 mm. Hg. They gave the following doses, 1/30 grain of nitroglycerin, 2 grains of sodium nitrite, and 2 grains of erythrol tetranitrate. On comparing the results obtained in normal individuals with the results in arteriosclerotic patients, they found them very similar. Nitroglycerin had the same effect upon arteriosclerotic patients as upon normal individuals. Sodium nitrite and erythrol tetranitrate acted a little less quickly, the maximum effect occurring a little later, and the duration of action being slightly longer than was the case with normal individuals. Wallace and Ringer obtained a fall of blood pressure in every case. They believe that the fall of pressure is due to the fact that the splanchnic vessels are no longer capable of dilatation. They also discuss the question of the best form in which nitrites should be given, and whether they deteriorate in activity by keeping. Amyl nitrite, as usually supplied in glass pearls, keeps well if not exposed to the light. Nitroglycerin tablets may retain their activity for a year or more. However, the content of nitroglycerin in fresh tablets may vary considerably, and it is best to make use of a solution of nitroglycerin. A 1 per cent. solution keeps fairly well, and is the most reliable as regards uniformity of strength. Solutions of sodium nitrite deteriorate rapidly. A solution should not be used which is over a week old. Matthew states that ordinary tablets of erythrol tetranitrate are usually inert, but that the full activity is retained by coating the tablets with chocolate. Wallace and Ringer have found that even after keeping for 1 year these tablets retain their full activity.

Miller and Matthews review the literature on pulmonary edema or its cause, and by experimentation have endeavored to determine whether acute pulmonary edema, produced by other agents than those already tried, is associated with a rise in pressure in the pulmonary artery; secondly, to repeat the experiments with acetic ether, since in the previous work the ascetic ether had been an exception, inasmuch as it produced pulmonary edema without an increase in pressure in the pulmonary artery; thirdly, the value of various agents in controlling the development of modifying the course of acute experimental pulmonary edema.

Nitric oxid, ammonia vapors and illuminating gas are all recognized as causing acute pulmonary edema in man. Hall reports 3 cases of edema under similar circumstances caused by ammonia vapors. Adrenalin often produces a pulmonary edema in rabbits, and Sahli refers to the frequency with which pulmonary edema occurs in dogs poisoned by hydrocyanic acid. These various agents were employed in our work, and in addition, the effect of artificial mitral stenosis on the pulmonary circulation. Dogs were used in most of our experimental work. In a few cases rabbits were utilized instead. Ether was used as an anesthetic. Artificial respiration was maintained by a bellows and motor. The pressure in the pulmonary artery was determined by a mercury manometer, the descending arm of which had twice the diameter of the ascending

arm; in this way slight changes in the pressure could be more readily detected. The canula was tied in the branch of the left pulmonary artery supplying the upper or middle lobe. The systemic pressure was taken from the right carotid. Pulmonary edema was considered present when froth issued from the trachea or could be expressed freely from the large bronchi by moderate compression of the lung. Their conclusions were as follows:

1. When pulmonary edema develops after exposure to nitric oxid or ammonia, there is no evidence that mechanical factors play a role; *i. e.*, we are unable to detect any evidence of disproportion between the working power of the two sides of the heart.

2. The acute pulmonary edema following inhalation or intravenous injection of acetic ether is usually associated with evidence of disproportion in the working power of the two sides of the heart, as there is a fall in the systemic pressure and a corresponding rise of pressure in the pulmonary artery. When large doses of acetic ether are injected intravenously pulmonary edema may occur without evidence of disproportion in the working power of the two sides of the heart, thus showing that such changes are not essential for its appearance. It would appear, therefore, that mechanical factors are not responsible for the edema.

3. In the acute pulmonary edema produced by iodids, there is in the beginning a marked rise in pressure in both the systemic and pulmonary circulation; later the systemic blood pressure falls, but the pressure in the pulmonary artery remains high. This proportion in the working power of the two ventricles was present in every instance; it would therefore appear from our experiments that the edema might be explained by mechanical agents, although not necessarily so.

4. The intravenous injection of adrenalin chlorid, when preceded by ligation of the thoracic aorta, causes pulmonary edema. Apparently as a result of the great increase in the systemic blood pressure after such a procedure, the left ventricle is unable to empty itself completely; stasis and rise in pressure in the pulmonary artery follows. This is perhaps the mechanism of acute pulmonary edema in nephritis with hypertension.

5. For therapeutic measures to be of value in the mechanical edemas, they should tend to equalize the work of the cardiac chambers. This may mean the use of vasodilators in some instances, in others the use of drugs that stimulate the heart activity.

Brooks and Koplan report the findings upon 2 cases in which adrenalin was used as a therapeutic agent for a prolonged time. They contradict the generally accepted assumption that adrenalin, no matter how it is used, constantly produces a rise in the blood pressure. An injection controlled by a sphygmomanometer on the arm will, however, soon dispel this idea and demonstrate that in order to produce this condition adrenalin must be either thrown directly into the blood stream or given as an intramuscular injection, and that even the elevation of the blood is often slight and always very transitory. Increase of blood pressure is rarely produced when the drug is given subcutaneously; in such instances the psychic effect of the injection should be taken into account. From the study of these 2 cases, they concluded that while admitting that the necrotic changes in this case were due to the adrenalin medication, these are not in any sense to be taken as contraindicating a moderate and temporary utilization of adrenalin in appropriate cases. On the contrary, the relatively slight degree of these changes in a case in which the drug was used so freely and for so long a time indicates, that in ordinary cases it may be used with relative impunity in amounts sufficient to produce therapeutic results.

FRACTURES AND DISLOCATIONS.

A REVIEW OF RECENT LITERATURE.

By NATHANIEL ALLISON, M. D.

1. LATE DEVELOPMENT OF DEFORMITY IN CONSEQUENCE OF FRACTURES.—Zesas (*Archiv. gen. d. Chir.*, 1909, iii., 471).
2. TREATMENT OF FRACTURES.—E. Lexer (*Muenchener Med. Woch.*, March 25, 1909. LVI., No. 12, 593-640).
3. FRACTURES OF THE OLECRANON AND THEIR TREATMENT BY DIRECT AND INTERNAL SPLINTAGE.—Corner (*Lancet*, London, January 23, 1909).
4. EXTENSION BY TRANSVERSE NAIL.—Wilms (*Zentralb. f. Chir.*, Leipzig, xxxvi., No. 3, p. 73-104).
5. THE OPERATIVE REDUCTIONS OF OLD DISLOCATIONS OF THE ELBOW.—Dollinger (*Deut. Zeit. f. Chir.*, 1909, c. 38).
6. FRACTURES OF THE ASTRACALUS WITH LUXATION OF THE FRAGMENTS.—Mauclaire and Petiteau (*Archiv. gen. d. Chir.*, 1909, iii., 575).
7. THE OPERATIVE TREATMENT OF UNUNITED FRACTURES.—Criete (*Deut. Zeit. f. Chir.*, 1909, cl. 276).
8. DOUBLE TRAUMATIC DISLOCATION OF THE SHOULDER.—Lindemann (*Deut. Zeit. f. Chir.*, 1909, ii., 561).
9. NON-OPERATIVE REDUCTIONS IN THE TREATMENT OF TRAUMATIC COXA VARA AND COXA VALGA.—Sprengel (*Centralb. f. Chir.*, 1909, xxxvi., 1745).
10. THE THEORY AND PRACTICE OF EXTENSION TREATMENT OF FRACTURES OF THE UPPER AND LOWER EXTREMITIES.—Henschen (*Archiv. f. Orth. Mch. und Unfall*, bd. 7, h. 4, p. 325).

The case which Zesas reports is one of unusual interest, especially from a medico-legal standpoint. Briefly the history is as follows: A man of 30 years fractured his tibia transversely at the junction of the upper and middle thirds. There was little or no displacement, and a good result was obtained as far as position was concerned and apparently with firm union. The man returned to work at the end of 4 months. At the end of a year he began to have pain in the seat of fracture and to limp. He also observed that there was a slight deformity developing. He came under the care of Zesas 2 years after the injury, pain had stopped some months before but the limp continued and the man presented a well-marked genu varum. About the seat of fracture there was a large solid callus. There are two explanations offered as to the cause of this late development of deformity: (1) that there is repeated fracture of the callus; (2) that there is no definite ossification of the callus. Violence has nothing to do with the production of the deformity; it is a slowly developed condition and seems to be the result of an ostitis started at the seat of fracture where constant slight injury and slight separation of the new bone tissue produce the clinical picture described.

Lexer advances a method of treatment for fractures which may be open to criticism after a perusal of the above clinical history. Lexer, however, reports 100 cases of typical radius fracture and 20 cases of malleolus fracture which have been treated by a method which he claims to favor rapid anatomical and functional healing. This method consists of strapping the limb with adhesive plaster in such a way as to allow free movement of the fingers and slight extension of the wrist and ankle, but does not allow either active or passive movements which would dislocate the opposed fractured fragments. After 2 days this bandage is removed and the limb is bathed and massaged. At the end of the first week all strapping is removed and only a simple bandage is worn. At the end of 2 weeks no further treatment is necessary, except observation. This method is one of departure from the classical treatment of fractures but Lexer claims 120 good results.

Wiring of the olecranon is an operation which is indicated in the majority of fractures of the olecranon, especially where there is wide separation of fragments in the early period or imperfect mobility of the olecranon later. Corner has found that internal splintage possesses the following disadvantages: The splints lead to absorption of the hard substance of the bone around them. This is followed by loosening of the splint and consequently by a greater danger of refracture after a sudden effort. The advantage of internal splintage is that the limb may be moved early, preventing limitation of motion. It makes little or no difference as far as the subsequent value of the limb is concerned whether the union between the fragments is fibrous or bony, provided there is good motion in the elbow joint. An excellent result can be obtained with or without operation provided the olecranon does not become restricted in its movements on the humerus, as the greater this restriction is, the worse is the result. The important clinical index following fracture of the olecranon is not bony union of the fragments, but the amount of motion that exists—in the elbow-joint.

To provide reliable extension after the reduction of a fracture Wilms has used a nail, driven through the bones in the arm or leg and protruding on each side beyond the skin. This nail has an eye in which a wire is fastened and thus extension is applied directly to the bone. Though the procedure is not original he has reported the results of 13 cases treated in this way, and says that it is a method of particular value in the treatment of T fractures of the humerus.

Dollinger has reported 34 cases of old dislocation of the elbow; 14 of these were resected and 20 were considered suitable for reduction by open operation. In the cases that were reduced the articular fossa of the olecranon was filled with pieces of bone, fat and the remains of joint capsule bound together by cicatricial tissue. This was removed, the joint cartilage being preserved. Reduction was then accomplished, not by pulling but by strapping the internal ligaments distalwards. After the reduction, the elbow was flexed to a right angle and the detached ligaments resutured in as near a normal position as possible. Of the 20 cases in which reduction was accomplished 2 showed complete ankylosis; in 1 there was slight motion; 3 complicated dislocations, were more suitable for resection than for reductions. The remaining 5 had movable joints, 2 of them complete flexion and 135° extension. Eight cases were lost track of. Of the 14 cases which were resected 11 were kept under observation, 6 of these 11 were stiff elbows and 5 had motion. It would seem that the end-results after reduction are better than after resection,

and that resection is indicated only in such cases as present destruction of joint surface to a degree that would make return of function impossible.

Mauclair and Petiteau state that in the treatment of fracture of the astragalus with luxation of the fragments there should be two objects in view, namely, to get the foot in good position and to obtain function. The fragments being removed from their position and being held there by the ligaments of the foot, the conditions surrounding reduction are quite different from those encountered in the fracture of the long bone. Non-operative reduction is practically impossible and cannot be maintained after it is accomplished. Also following manipulation here the development of callus would tend to limit joint function. They accordingly recommend an astragalectomy as giving the best functional results.

Criete's report covers 30 cases of ununited fracture. The most frequent cause for non-union is intraposition of soft tissues between the fragments. This was observed in 18 cases. Of the 30 cases the tibia was fractured in 28, the femur in 1 and the humerus in 1. Seventeen cases were simple fractures and 13 cases were compound. The method of Diffenbach was employed in 15 cases, using ivory pegs or wire sutures. The time of union varied from 5 weeks to 28 weeks. In 1 case a steel nail was used and union failed. In 14 cases the ends were resected and sutured together. One of these died of sepsis. In 2 cases no bony union took place. Eleven cases resulted in union but healing was long drawn out and it was necessary to remove the sutured in 4 cases. Criete believes from this experience that the method of Diffenbach is better than the resection method. This method consists of freely exposing the seat of fracture by a flap incision, introducing ivory pegs, one above the other below the fracture, through holes drilled through the bone and cutting the pegs off level with the surface of the bone. The ivory pegs in all of his cases were retained.

Lindemann reports 3 cases of traumatic dislocations of both shoulders and also 2 cases of dislocation in both shoulders in persons who had previously sustained traumatic dislocation of one or the other shoulder. Changes in the ligaments and soft parts resulting in relaxation of the joint, as well as degenerative changes about the joint, are etiological factors in this condition. Violence is not always necessary, as the condition may result from muscular contraction. In 1 of his cases there was a tearing-off of the greater tuberosity, and in 1 case recurrent dislocations followed, amounting to about 200 dislocations. One day 3 dislocations took place.

Sprengel reports that he has seen 20 cases of either coxa vara or coxa valga due to traumatism in which a diagnosis of hip disease had been made. He lays especial stress on the importance of not confusing these conditions with hip disease, and points out the fact that the radiograph is here of the utmost importance. These cases have slight dragging of the limb, slight abduction and slight external rotation, and the joint movements limited. With this there is a history of traumatism. As treatment he recommends correction under an anesthetic, placing the limb in forcible extreme abduction and extreme internal rotation. The limb is here held for several months in plaster-of-paris, the position being judged by the x-ray; the object of treatment, of course, being to re-establish the normal angulation between the femoral neck and the femoral shaft by correcting the position of the displaced upper femoral epiphysis.

Henschen says that the excessive weighting of the limb in order to produce extension is a method which incurs certain dangers and also

produces no good effect beyond the first twenty pounds pulling. The method of Bardenheuer dates back to Hippocrates, and is designed to overcome the deforming action of muscular contractions. The evils which arise from the use of excessive force in producing extension are passive over-stretching of the muscles, loosened joints, pressure atrophy and pressure sores. He advises a suspension-extension apparatus following exact manual reduction, and says that this must be applied within the first 3 days.

THE ETIOLOGY OF TRACHOMA.

A REVIEW OF RECENT LITERATURE.

By JOHN GREEN, JR., M. D.

1. PRELIMINARY REPORT OF A THEORY OF THE ETIOLOGY, PREVENTION, PATHOLOGY, AND TREATMENT OF TRACHOMA.—Eaton (*Ophthal. Record*, September, 1908).
2. THE MORBID AGENT OF TRACHOMA.—R. Greef (*Deutsch. med. Woch.*, 1909, No. 12).
3. THE MORBID AGENT OF TRACHOMA.—Halberstaedter and von Prowazek (*Deutsch. med. Woch.*, 1909, No. 17).
4. PRELIMINARY NOTE ON THE FINDING IN CUBA OF THE BODIES DESCRIBED BY GREEF AS THE CAUSATIVE AGENT OF TRACHOMA.—Finlay and Cartaya (*Bull. of the Health and Charities Dept. of Cuba*, May, 1909).
5. TRACHOMA BODIES IN THE DEEPER CONJUNCTIVAL TISSUE.—Radzieski (*Woch. f. Ther. u. Hyg. d. Aug.*, August 19, 1909).
6. TRACHOMA FINDINGS IN SMEARS AND SECTIONS.—Wolfrum (*Klin. Monatsbl. f. Augenh.*, October, 1909).
7. A CONTRIBUTION TO THE QUESTION OF THE CAUSE OF TRACHOMA.—Werner (*Zeitschrift. f. Augenh.*, October, 1909).
8. A RAPID METHOD OF STAINING THE TRACHOMA BODIES OF HALBERSTAEDTER AND VON PROWAZEK.—Verhoeff (*Ophthalmic Record*, October, 1909).
9. HAS THE CAUSE OF TRACHOMA BEEN DISCOVERED?—Schmidt-Rimpler (*Muench. med. Woch.*, August 3, 1909).
10. CONCERNING THE ETIOLOGY OF THE SO-CALLED TRACHOMA BODIES FROM THE STANDPOINT OF INVESTIGATION TO DATE.—Reis (*Wiener klin. Woch.*, June 24, 1909).

The discovery of the so-called "trachoma bodies," which are claimed by their discoverers, Greef, Halberstädter, and Prowazek, to be the causative agents in this disease, has initiated general discussion on the subject of the etiology of trachoma.

Eaton (1), in a paper of a highly speculative character, claims that trachoma is primarily an infection of the blood by organisms which are "protoplasmic bodies." They are of two kinds, exogenous and endogenous, and enter the circulation through the palpebral conjunctiva. The life cycle of the exogenous parasite is completed in the blood and tissues of certain animals and birds, and is carried to the human conjunctiva by the legs, bodies, etc., of insects. The endogenous parasite is infective from one human being to another. Trachoma is found in two forms, clinically indistinguishable, but biologically different. The "contagious" form is caused by the endogenous parasite, the non-contagious form by the exogenous parasite. There is a cachexia from blood infection. The principles contained in the theory of opsonins should be successful in the prevention, treatment and cure of both forms of the disease. When the

granulations appear near the surface, the usual local remedies may suffice, but when thus apparently cured, the disease may recur unless the proto-plasmic bodies in the blood are destroyed.

R. Greef (2) claims that his original observations of the morbid agents of trachoma have been substantiated by later observations. They consist of very regular round bodies, smaller than the smallest cocci. They stain violet or red by Giemsa's method, slightly with aniline colors, but not according to Gram. Under highest magnification they appear slightly oval, surrounded by a light halo or mantle. They must not be confounded with eosinophile granules. In later stages they occur heaped up within the cells. Greef found them in the follicles, extra and intra-cellular in the epithelium, and free in the secretion. Only fresh cases show the cocci, as treatment, with copper sulphate, tends to remove them from the surface.

The following method is recommended: The secretion or epithelium is picked up on a platinum loop, spread very thinly on a cover glass, dried and fixed in absolute alcohol for 30 minutes. The cover glass is immersed for 6 to 9 hours in the stain, which consists of 12 parts of Giemsa eosin solution, 3 parts of Azur I., 3 parts of Azur II. These must be thoroughly mixed and heated to 37° C. After the staining the cover glasses are irrigated with distilled water and dried with blotting paper.

Halberstaedter and von Prowazek (3) claim priority in the discovery of the epithelial enclosures in trachoma, and point out the fact that their papers appeared two years previous to Greef's.

Finlay and Cartaya (4) quote Greef's description of the cycle of the parasite as follows: "At first it appears in the shape of small, well-stained granulations, grouped in pairs, within the cell protoplasm and surrounded by a clear zone; later, near the nucleus some reaction products appear; later on a conglomerate mass is formed surrounded by the clear zone, close to the cell nucleus. The mass grows larger and larger, the clear zone gradually disappears, until the whole of the protoplasm is invaded, the cell then ruptures and the granules are set free.

In the cases of typical trachoma, the writers found all the forms described by Greef. The numbers of bodies was small in a mild case. They were found in the epithelial cells, leukocytes "corpuscular" cells (the nature of which is uncertain) in cellular detritus proceeding from these cells, and free among the cells. In most of the cases the material was obtained by expression of the follicles, but good results were obtained from surface preparations. They are best observed in epithelial and epithelioid cells.

Radziezski (5) embedded in paraffin, deeply excised portions of trachomatous conjunctivæ and found that with Giemsa's stain and a modification of Heidenhain's method, the trachoma bodies were demonstrable in the deeper tissue sections. Wolfrum (6) confirms the presence of Halberstaedter-Prowazek bodies in the epithelium of the trachomatous conjunctiva. He found them not only in scrapings, but also in sections of the upper fornix, after the specimen had been fixed in sublimate-formol. In the author's opinion the absence of the bodies from the subepithelial tissue does not speak against their etiological importance.

Werner (7) carefully examined a large number of preparations from fresh trachoma cases and other varieties of conjunctivitis, using Greef's modification of Giemsa's stain. In all examples of early trachoma he found the cell inclusions and in many patients whose trachoma was no longer fresh and had been treated, he also detected them in smaller

numbers. They were absent from cicatricial trachoma, and from all other varieties of conjunctivitis.

One of the drawbacks to rapid diagnosis has been the rather lengthy staining technique. Verhoeff (8) contributes the following method "while the patient waits." Specimens are obtained by scraping the cocaineized conjunctiva with one edge of a cover glass. This is diluted with tears, spread upon the surface of other cover glasses, and allowed to dry in the air. Wright's modification of Leishman's stain is allowed to act for one minute. Distilled water is then added until a slight scum is formed upon the surface of the liquid, which is allowed to remain for 3 or 4 minutes. The preparations are then differentiated by washing away the staining mixture with distilled water and by allowing the water to act for one minute.

Schmidt-Rimpler (9) declares that the part the trachoma bodies play in the etiology of the disease must be decided from the results obtained from inoculations made with pure culture material. Until these bodies are isolated and cultures made and inoculations are followed by true trachoma, these will always remain a doubt as to whether they stand in true etiologic relation to the disease.

Reis (10) investigated 80 cases of trachoma at various stages and 20 cases of other forms of conjunctivitis. In only two cases—one of acute trachoma, the other of papillary hypertrophy with granuloma—was he able to find the *v. Prowazek* bodies. Reis also expressed doubt as to their being the active disease producers, and ventures the opinion that they may be reactive products.

CORRESPONDENCE.

THE AUTOSEROTHERAPY OF ASCITES.

By AUGUSTE A. HOUSQUAINS, M. D.

As is quite well known by this time, the method of injecting a certain quantity of pleural fluid subcutaneously, in cases of pleurisy, has recently come in for considerable praise. This therapeutic measure, instituted after the successful experiments of Gilbert, of Geneva, has inspired MM. V. Audibert and F. Mourges, of Marseilles, with the idea of applying a similar method in the treatment of cirrhotic ascites. In a report recently read before the Biological Society, the experimenters made public the results obtained in a patient aged 41, and gave a complete clinical picture of an ascites of hepatic origin. Although the method has not been fully tried and cannot be considered scientific, one is nevertheless justified in saying that, even with these drawbacks, the case reported by M. M. Audibert and Mourges is convincing, since the ensemble of facts and their chronological succession, the clarity of the presentation of the clinical points, cannot but lead one to think that, as regards autoserotherapy, a satisfactory therapeutic method in attacks of recurring ascites has been found. Hence it is not uninteresting for clinicians to know that a new field for research is at their command, one which will not only yield them considerable satisfaction, but be the means of benefiting the sick.

If we revert to the writings of Hoppe Seyler, we shall see that the ascitic fluid, especially when it is of hepatic origin, includes in its make-up a considerable quantity of the essential ingredients which enter into the composition of physiological serum and the organic tissues. Thus, besides water, the serous fluid in ascites contains in 1000 parts, about 30 parts of solid matter, 20 of albumin, 3 of ethereal extracts, either alcoholic and aqueous, 7 of soluble inorganic salts, 0.70 of insoluble inorganic salts, 0.30 of urea and a great quantity of carbon dioxid, oxygen, and nitrogen.

It can readily be seen that for the organism this must mean a veritable loss of alimentary substances, speaking in a broad sense, and, in the end, of energy. The advocates of the new therapeutic method, recognizing the fact that these different substances are later on destined to be an integral part of the blood, arrived at the opinion that if it were possible to introduce them again into the system, even in minimum doses, a beneficent reaction would be produced. As a result of this idea, experiments were undertaken.

The patient in question had had in December, 1906, an uncomplicated variola, which had lasted 3 weeks. Two months later she developed the first signs of an ascitic syndrome. She had no hereditary or acquired physiological defects, nor was she an alcoholic.

In February, 1907, without warning and whilst apparently in good health, she had hematemesis, and melena which persisted for some time.

In May she had icterus with discoloration of the fecal matter which lasted a month. In December there was a renewal of hematemesis, this time very profuse. In December, 1908, the abdomen began to distend, and in January, 1909, its size became so great that the patient had to be sent to a hospital. Successive tapplings gave relief, but the fluid invariably reformed. The quantity of urine was scarce, varying from 400 to 800 grams in 24 hours.

Injection into a guinea pig with a certain quantity of the liquid, as well as the ophthalmic-reaction, was negative; hence the conclusion was that tuberculous peritonitis was absent.

Neither treatment nor alimentary regimen modifying the situation, MM. Audibert and Mourges commenced the serotherapy treatment on September 8th. Here is the technique which they pursued: After the skin is cleansed aseptically and is anesthetized with ethyl chlorid, the needle of the syringe is inserted into the skin on the left side of the abdomen. In case the abdomen is tender as the result of a previous paracentesis, by which the ascitic fluid was materially lessened, the abdominal wall should be supported and held down; then withdrawing the needle until its point is in the connective tissue, the ascitic fluid is reinjected directly under the skin. Neither pain, accident nor local reaction has been observed following the injection. During the space of 76 days, 12 injections of ascitic fluid were made at intervals of about 6 days. The first injection consisted of 3 c.c., the second of 5 c.c., the third of 7 c.c.; then 10 c.c. were used, a quantity which was never exceeded.

The following remarkable result then ensued: Before the first injection the urine amounted to 600 c.c.; the day after the first injection the amount was 800 c.c.; three days later it was 1700 c.c. At this time, that is to say on September 11th, a second injection was made. The next day and the day after, the quantity of urine ranged from 2000 to 2100 c.c. Of course this abnormal quantity could not be maintained, hence the amount fell to 1200 c.c. The third injection caused the quantity of urine to increase to 1700 c.c. in 6 days. Similar changes took place after each injection.

It is well to remember here that the polyuria did not manifest itself habitually the day the injection was made. Apparently the kidneys did not respond immediately to the stimulation produced by the injection of the ascitic fluid. Their activity manifested itself only after 24 hours; therefore the experimenters have put the question, not without some show of reason, that this method might be of service in renal insufficiency. Surely so important a question is worthy of further study.

From now on, in the case reported by the experimenters, constant polyuria was produced by the subcutaneous injections of the ascitic fluid, as the patient, instead of voiding from 500 to 800 c.c. of urine per day, voided from 1200 to 1800 c.c. Synchronous with this polyuria, the general condition of the patient improved. While paracentesis had to be resorted to every 2 weeks for 6 months prior to the injections, from September 3d to November 15th it was unnecessary, the size of the abdomen having diminished progressively. Up to November 15th the patient was kept on a milk diet, then she was given pates and purées without salt, and the result was that there was a rapid reappearance of the ascites. Face to face with this untoward situation, the experimenters increased the quantity of the third injection to 7 c.c. The amount of urine which had been only 1100 c.c. increased to 1500 and 1800 c.c., and the size of the abdomen remained stationary; in fact, there was even a slight diminution. Although it must be admitted that changing the

milk diet to more solid food aggravated the general condition of the patient, this alimentation was nevertheless persisted in, the experimenters being of the opinion that by increasing the quantity of the subcutaneous injections they could counteract any of the evil effects from an increased diet. Their conjectures were right, since the size of the abdomen diminished to such an extent that paracentesis was no longer necessary.

The quantity of the chlorides during the period of absolute lacteal regimen, ranged from 1 gram to 1.90 grams. After the feeding of the patient was varied, the quantity of the chlorides increased to 2 and sometimes 3 grams. Hence it is right to state that the quantity was not influenced by the serotherapy; but despite this there was no renal insufficiency. As to the temperature, it was not appreciably affected by the ascitic serotherapy.

What should be our inferences at present from the facts above recorded?

In the first place, we must recognize the fact that this method seems absolutely innocuous. Locally there is neither pain nor inflammatory reaction. As regards the general condition of the patient, the thermic curve, the quantity of chlorides, and the amount of urea, they are not influenced to any appreciable extent by autoserotherapy.

The dominant fact in this treatment was the production of a constant and profuse polyuria, which was maintained even when the patient's diet was considerably varied. Instead of limiting the diet exclusively to milk, as is generally done in these cases, with the result that the patient's vitality is lowered, the advantages accruing from the subcutaneous injections of ascitic fluid, as practiced by Audibert and Mourges, are that despite the mixed diet the vitality is increased; the only precaution to be remembered being to increase the quantity of the injection directly the milk diet is varied by the addition of other food. The quantity of the injections is never very large, as the experimenters never injected more than 10 c.c. of the ascitic fluid.

To sum up, the autoserotherapy of ascites has yielded excellent results. Since all other modes of treatment have failed, it would be wise to have recourse to this method in all cases of recurring ascites.

March 10th.

OBITER DICTA FROM FOREIGN JOURNALS.

THE PHYSICIANS IN THE ROMAN ARMY: THEIR NUMBER AND THEIR RANK.

It is always a matter of interest to the student of medical history to learn something new about the social status of physicians centuries ago, since with this knowledge he is in a better position to combat any criticism which he may hear to-day, to the effect that only in very modern times, when civilization became a fine art, was the medical practitioner placed on an equal footing with other men. Information such as this is an excellent asset to bring to bear on those ignorances which even now crop up when laymen descant on ancient or modern social history, with special reference to the lowly state of physicians in those far-off times that are supposed to play the dawn to our larger day. Whether or not Dr. Julien Noir had in mind the correction of current lay opinion regarding the medical profession, when he wrote his article in *Le Progrès médical*, is of small moment; but what is of importance is the fact that no intelligent reader can peruse the article without realizing that the appreciation of physicians' worth by a government is not altogether so modern a chapter in the world's history as writers on sociology would have us to suppose. Dr. Noir's interesting essay runs thus: In the heroic times of the Roman Republic the physicians were of Greek origin and, for the most part, slaves; hence, their social position was not one that could merit esteem. The elder Cato, if we are to believe Plutarch, intensely disliked all things that emanated from Greece, whether it was her philosophers or her physicians. To get on, during periods of illness, without the aid of a hated Greek physician, he devised a primitive *materia medica* in which he jotted down the most absurd prescriptions and the most fantastic regimens. Fortified with this knowledge he did not hesitate to be both physician and nurse to any ailing member of his family, or to his many slaves.

However, in the first centuries of our era, under the Roman Empire, Greek culture was no longer disdained by the Romans; and with this appreciation in force the status of the physicians changed materially. In the army they were on the same footing as the centurions: that is to say they occupied the rank of superior officers.

In the great "Corpus inscriptionum latinarum," (Vol. VI., page 201, No. 1058), edited by the German historian, Theodor Mommsen, Mowat, the well-known archæologist, came across a copy of an inscription which is engraved on the base of a column six feet and nine inches in height and two feet and nine inches in width. This column discovered in the Villa Maffei in Rome, was acquired by a wealthy collector of antiquities, Von Hoffmann, and conserved on his estate on Mount Cælian. On the anterior side of the base there is an inscription in honor of the Emperor Caracalla dated 210 A. D., to the effect that the column was the gift of the officers of the fifth cohort of the Vigiles. After the inscription follows a long list of all the men of the cohort, some seven

centuries, which with the officers' names formed a force of nine hundred and fifty-three Vigiles. Each name is designated by the initial of the first name; the family name and the surname being written out in full. Below this list are engraved two symmetrical laurel wreaths. In the left wreath one can decipher that the monument was erected on the Nones of July, 210, during the consulate of Faustinus and Rufinus, through the instrumentality of the oldest centurion, C. Antonius Autullus, assisted by the standard-bearer (vexillarius) M. Minucius Honoratus. In the wreath on the right side there appear the following names:

G. RVNNIVS, HILARIS
C. IVLIVS, HERMES
Q. FABIVS, POLLVX
S. LVTATIVS, EGARPUS
MEDICI

From the above it is reasonable to infer that there were four physicians attached to this cohort of the Vigiles, a force of one thousand men, and that these physicians were highly esteemed; otherwise their names would not have appeared within the somewhat scared confines of a laurel wreath. The fifth cohort of the Vigiles was not the only one that had physicians in its ranks, for Mommsen makes mention in another part of his work (*Corp. inscr. Latin.* VI. p. 219, No. 1059), of an inscription in a manuscript at Naples belonging to the antiquary Smet, which was copied from a marble table, now lost, but which was discovered in the Santa Bibiana church in 1551. This inscription also dates from the time of Caracalla and, similar to the inscription of the fifth cohort of Vigiles, gives the names of the whole staff of the second cohort including those of the four physicians. The latter names can hardly be deciphered, and it was only on account of Mommsen's extraordinary patience that the following text was evolved: MEDIC. COH. II., CLAUDI THAMYRA, FLAVI PAN (here there is a flaw in the stone) E, [JULI EP] APHRODITE, AURELI HEGUMENE.

Our conclusions, after reading what precedes, lead us to think that the seven cohorts of the Vigiles,—companies that were to Rome what our fire departments and municipal police are to modern cities,—were never without four physicians to each cohort; and, be it added in no small voice, these enjoyed not only the respect of their fellow-officers but occupied enviable positions on the staff. All this speaks highly for Roman tolerance since, as was stated before, nearly all of them were Greek in origin.

The Romans, as is well known, paid special heed to the health and the hygienic surroundings of their troops, a fact that was brought home to us only a short time back when the vestiges of a Roman military hospital were discovered in Switzerland. These remains, in connection with the inscriptions of the second and fifth cohorts, give sufficient evidence of a solicitous attitude, on the part of the Roman legislators, in regard to the health and welfare of the rank and file in the army.

BOOK REVIEWS.

TASCHENBUCH DER THERAPIE MIT BESONDERER BERÜCKSICHTIGUNG DER THERAPIE AN DEN BERLINER, WIENER U. A. DEUTSCHEN KLINIKEN. Herausgegeben von Dr. M. T. Schnirer. Sixth Edition. Wuerzburg. A. Stuber's Verlag (C. Kabitzsch), 1910. Price M. 2.

This is a useful little therapeutic compend. The first half of the volume takes up in alphabetic order the various diseases and very briefly suggests diagnostic points and treatment. The second half is devoted to the description, action and administration of drugs, also in alphabetic order. An appendix discusses physical methods of treatment.

FUNCTIONAL DIAGNOSIS. THE APPLICATION OF PHYSIOLOGY TO DIAGNOSIS. By Thomas G. Atkinson, M. D. Chicago: Chicago Medical Book Co. Price \$1.00.

This is not, as the reader might be led to expect, a book on functional diagnosis in the commonly accepted sense. A book devoted to methods for ascertaining the ability of the various organs to fulfill their physiologic functions, in spite of pathologic conditions present, would be of great value and would fill a long-felt want in medical literature. Dr. Atkinson, however, has merely attempted to treat the subject of medical diagnosis from the physiologist's point of view, laying stress upon functional rather than anatomic abnormalities. It does not appear that this method has any greater value than the one usually followed in similar text-books.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS. By Hobart Amory Hare, M. D. B. Sc. Thirteenth Edition. Illustrated. Philadelphia and New York: Lea & Febiger. 1909. Price, cloth, \$5.00.

Hare's classical work on Practical Therapeutics is so well known that a new edition, thoroughly revised and up to date, while welcome, requires no detailed discussion. Suffice it to say, that no text-book on therapeutics in the English language fills quite the place that does this one and that no physician can afford to be without a copy in his library.

DIE PATHOLOGISCH-HISTOLOGISCHEN UNTERSUCHUNGSMETHODEN. Von Prof. Dr. G. Schmorl. Fuenfte neu bearbeitete Auflage. Leipzig: Velag von F. C. W. Vogel. 1909. Price M. 10, bound.

Prof. Schmorl's treatise on pathologic histologic technic originally appeared as an appendix to Birsch-Hirschfeld's text-book, but its importance and the increased bulk necessitated by the inclusion of new methods soon occasioned its separate publication. It is now one of the standard works on this subject and is indispensable as a book of reference for any one doing finer pathologic work. About one-third of the volume is devoted to microscopic pathologic technic in general, the rest of the book treating of methods specially applicable to the various tissues and organs.

INFECTIOUS DISEASES, A PRACTICAL TEXT-BOOK. By Claude Buchanan Ker, M. D., F. R. C. P. Oxford Medical Publications. London: Henry Frowde (Oxford University Press); Hodder & Stoughton. 1909.

As its title indicates, Ker's book is above all a practical one. An enormous experience in the Edinburgh City Hospital has enabled the author to discuss the various infectious diseases with a keenness and originality not often found in works of this nature. If the discussion of the bacteriologic and pathologic aspects of disease is sometimes not quite adequate, this is more than compensated by a wealth of clinical observation. Few books are so worthy of unqualified praise, and no student or practitioner will regret its purchase. A number of superb illustrations ornament and illumine the text.

DISEASES OF THE HEART. By James Mackenzie, M. D., M. R. C. P. Second Edition. Oxford Medical Publications. Oxford University Press, American Branch, New York. 1910. Price \$5.50.

The first edition of this important work was reviewed in these columns last year. The second edition has been carefully revised and a chapter on the electro-cardiogram added by Dr. Thomas Lewis. The book is concerned chiefly with that portion of the subject of heart disease for which Dr. Mackenzie is chiefly noted, namely, the graphic methods, their importance in diagnosis, prognosis and treatment. So far from being of a pure scientific or theoretic interest, these methods are definite practical importance and it will not be long before they will be in constant use by all internists. At present, Dr. Mackenzie's book is the only adequate presentation of the subject in the English language. The price of the second edition has been considerably reduced below that of the first.

THE MEDICAL COMPLICATIONS, ACCIDENTS AND SEQUELAE OF TYPHOID FEVER AND THE OTHER EXANTHEMATA. By Hobart Amory Hare, M. D., B. Sc. and E. J. G. Beardsley, M. D., L. R. C. P. With a Special Chapter on the Mental Disturbances Following Typhoid Fever. By F. X. Dercum, M. D. Illustrated. Philadelphia and New York: Lea & Febiger.

Most medical text-books, in discussing typhoid fever, deal chiefly with the typical picture of the disease. No pathological condition, however, more frequently presents atypical cases and it is with these aberrant forms and the courses which they pursue that this book deals. Special chapters are devoted to the varieties of onset, aberrant symptoms and complications, the complications of the period of convalescence, the conditions which resemble typhoid fever, the occurrence of second attacks and the mental complications. The second part of the book is devoted to a similar consideration of variola, scarlatina, measles, varicella and rubella. So far as we know, no other book covers just this ground.

SURGICAL DISEASES OF CHILDREN: A MODERN TREATISE ON PEDIATRIC SURGERY. By Sam'l W. Kelley, M. D. New York: E. B. Treat & Co.

This volume is a fortunate publication, as at this time there is no book that covers this field, although numerous authors have covered each of the subjects or groups by treatises of more or less value. A complete work has long been desired and in this book Dr. Kelley gives us a most satisfactory and thorough handling of a field that becomes more prominent each decade. Of the chapters that deserve special mention, because of the rather unusual but very helpful classification, the one on General Surgical Pathology of the Developing Period should receive first mention. Other well-considered chapters are those upon the Surgery of the Air Passages, the Abdomen, Esophagus, Stomach and Intestines. The section on Hernia is well presented. Those parts of the work which are usually considered in works on orthopedics are up to the standard, but do not require special mention.

MYOMATA OF THE UTERUS.— By Howard A. Kelly, M. D., Professor of Gynecological Surgery at Johns Hopkins University; and Thomas S. Cullen, M. B., Surgery at Johns Hopkins University; and Thomas S. Cullen, M. B., Associate in Gynecology at Johns Hopkins University. Large octavo of 700 pages, with 388 superb original illustrations by August Horn and Hermann Becker. Philadelphia and London: W. B. Saunders Company. 1909. Cloth, \$7.50 net; half morocco, \$9.00 net.

We are of the opinion that this subject has never before been studied in such a diligent manner or presented in such complete and exhaustive form. Kelly and Cullen are extraordinarily well equipped to speak authoritatively on the pathology, diagnosis and therapy of uterine myomata. Supported by Horn and Becker, the well-known artists, and by a publishing house which seems to have been willing to lend liberal support to all their efforts, the two authors have given to the profession a book of unexcelled value and beauty.

DIAGNOSTIC THERAPEUTICS. A Guide for Practitioners in Diagnosis by Aid of Drugs and Methods Other than Drug-Giving. By Albert Abrams, A. M., M. D. New York: Rebman Company. Price \$5.00, cloth.

The idea upon which Dr. Abrams' latest book is based is not a bad one. Every practitioner meets with obscure cases in which light is thrown upon

the diagnosis by the success or failure of the treatment undertaken. A systematic analysis of the occasions and manners in which the result of treatment clears up the diagnosis would make a monograph or a small volume of great value. In order, however, to build up his portly tome of over one thousand pages, the author has had to include a vast mass of extrinsic matter, scores of pages that properly belong to a text-book of therapeutics, much of his well-known book on "The Blues," a hodge-podge of quotations in prose and verse that almost make one imagine he is reading the *Anatomy of Melancholy*. The book represents an enormous amount of erudition, much keen clinical observation and clever deduction, but the reader who goes to it for a clean cut exposition of diagnostic therapeutics will be disappointed. As a book to dip into or occasionally to refer to it unquestionably has its value.

RETINITIS PIGMENTOSA. With an Analysis of Seventeen Cases Occurring in Deaf-Mutes. Being an Essay for which was awarded the Alvarenga prize of the College of Physicians of Philadelphia, July, 1908.—By Wm. T. Shoemaker, M. D., Philadelphia. With illustrations, three in colors. Philadelphia: J. B. Lippincott Company.

Dr. Shoemaker had the opportunity of having under observation for several years 17 cases of retinitis pigmentosa in deaf-mutes. The results of his careful study and analysis of these cases form the basis of a scholarly monograph covering the history and anatomico-pathological characteristics, the symptomatology, ophthalmoscopic appearances, etiology, prognosis, treatment, medical direction and laboratory findings of the observed cases.

This little work is a model of exact and careful clinical observation. It is embellished by 3 exquisite colored pictures of typical fundus appearances in this disease.

SERUM DIAGNOSIS OF SYPHILIS AND THE BUTYRIC ACID TEST FOR SYPHILIS. By Hideo Noguchi, M. D., M. Sc. Philadelphia and London: J. B. Lippincott Company.

While the clinical value of the Wassermann reaction in syphilis has become pretty well established, the voluminous literature on the subject is scattered throughout many journals so that the practicing physician finds it difficult to obtain a clear notion of the subject. For this reason, this clear and concise presentation of the subject by Noguchi, who, as an associate member of the Rockefeller Institute for Medical Research, has contributed to the establishment and simplification of the subject, should find a wide welcome. In the concluding chapter he describes his own butyric acid test which, if its reliability is confirmed by others, should prove generally useful. It depends upon the precipitation of the globulin in blood serum or spinal fluid by means of boiling with a butyric acid solution and the subsequent addition of alkali. The globulins, if present in excess, are precipitated as a granular deposit. This excess of globulins, Noguchi states, is present in nearly all syphilitic and parasyphilitic patients even more constantly than the Wassermann reaction. It is also present, to be sure, in various acute infections, but these can readily be distinguished clinically from syphilis and, at all events, a negative Noguchi reaction, he believes, excludes syphilis.

MEDICAL GYNECOLOGY.—By Howard A. Kelly, M. D., Professor of Gynecological Surgery in the Johns Hopkins University, and Gynecologist to the Johns Hopkins Hospital, etc., etc. With 163 illustrations, for the most part by Broedel and Horn. New York and London: D. Appleton & Co. 1909.

An enormous variety of subjects are discussed in this book. There may be some doubt whether all of them properly belong to "Medical Gynecology," but they are discussed so interestingly by the versatile author that nobody could object to their presence in this instructive and, we may say, entertaining volume. But then, what is "Medical Gynecology"? With as much propriety any other specialty could be divided up into a surgical and medical half. Of course, in this country the surgeons look upon gynecology as a part of their specialty, and, therefore, it may be appropriate in this form to call their attention to the fact that there is also a non-operative or "medical" side to gynecology. In other words, there does exist a well-defined specialty which should be known as gynecology. Does it not seem like irony that just this book should have been written by the Professor of Gynecological Surgery? Perhaps the Johns Hopkins University will now change the title of the eminent author of this volume into Professor of Gynecology—as it should be.

LIVING ANATOMY AND PATHOLOGY. The Diagnosis of Diseases in Early Life by the Roentgen Method.—By Thomas Morgan Rotch, M. D., Professor of Pediatrics, Harvard University. 303 illustrations. Philadelphia: J. B. Lippincott Company.

This work, in a comparatively unplowed field, is a welcome addition to the literature of pediatrics, for it not only supplies much specific information in a special branch, but it will undoubtedly stimulate a more intensive study of the application of the x-ray to pediatrics. Owing to the fact that the book attempts to cover the entire field, it appears, in parts, to be little more than a catalogue of the various uses to which the Roentgen ray may be put in the diagnosis of diseases of childhood; nevertheless, many detailed observations are herein recorded which are invaluable in the interpretation and differentiation of the roentgenograph.

The book is unique from several aspects. The presentation of the subject is almost entirely objective by means of 262 full-sized x-ray reproductions, which are explained by short legends and are amplified by a varying amount of text.

This collection of roentgenograms is the work of Dr. A. W. George of Boston, who has had peculiar success in the roentgenography of children. From the technical standpoint the plates are perhaps superior to anything yet published in this line. Although made by a comparatively slow method (30-40 secs.), the plates are uniformly sharp and diverse. Just how to induce a young child to remain absolutely quiet for that length of time seems to be Dr. George's secret.

By far the most valuable part of the book is that dealing with the development and growth of the skeleton. The normal osseous development is traced from fetal life to adolescence. Especial stress is laid upon development and growth of the epiphyses, and this study constitutes the nucleus of the book, for it casts much new light from many angles upon the growing child. It reduces the study of juvenile development, growth and nutrition, to an accurate tangible basis. By means of the x-ray plate, reliable evidence as to the development and state of nutrition is always at hand.

Dr. Rotch's classification of children, according to their anatomical development, rather than chronological age, is fully elucidated. Anatomical development as an index to the stage of development and growth as well as to the stage of nutrition is insisted upon, and their recognition from the x-ray plate must constitute a distinct step in advance.

The sections upon diseases of the new-born and nutritional disturbances illustrate the gross pathology of these conditions as seen upon the skiagram, and show how to differentiate them roentgenographically. This part of the work is an intra-vitam study of gross bone pathology.

The last half of the book deals with the various medical and surgical conditions in which the x-ray may be used. The consideration of epiphysitis and its relation to the various joints is of especial interest. All of the commoner surgical conditions including fractures are here pictured. The purpose of this book seems to be to suggest to the reader when and how the x-ray may be used in pediatrics. The bookwork itself is excellent and the volume as a whole forms a most welcome addition to pediatric literature.

BOOKS RECEIVED

HANDBOOK OF THERAPY. Pp. 421. Chicago: American Medical Association. 1910. Cloth, \$1.50.

ANNUAL REPORT OF THE SURGEON-GENERAL OF THE PUBLIC HEALTH AND MARINE HOSPITAL SERVICE OF THE UNITED STATES FOR THE FISCAL YEAR 1909. Washington: Government Printing Office. 1910.

HIGH FREQUENCY ELECTRIC CURRENTS IN MEDICINE AND DENTISTRY: THEIR NATURE, ACTIONS AND SIMPLIFIED USES IN EXTERNAL TREATMENTS. By S. H. Monell, M. D. Finely illustrated, with special instruction plates. 8vo., 448 pages. New York: William R. Jenkins Company. Cloth, \$4.00.

ANATOMY AND PHYSIOLOGY FOR NURSES. By Leroy Lewis, M. D., Surgeon to and Lecturer on Anatomy and Physiology for Nurses at the Lewis Hospital, Bay City, Michigan. Second edition, revised and enlarged. Philadelphia and London: W. B. Saunders Company. 1910. Price, \$1.75.

THE ELEMENTS OF THE SCIENCE OF NUTRITION. By Graham Lusk, Ph. D., Sc. D., F. R. S. (Edin.), Professor of Physiology at the Cornell University Medical College, New York City. Second edition, revised and enlarged. Philadelphia and London: W. B. Saunders Company. 1909. Cloth, \$3.00 net.

NEW AND NON-OFFICIAL REMEDIES, 1910. Containing descriptions of articles which have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association prior to January 1, 1910. Price, paper, 25 cents; cloth, 50 cents. Pp. 256.

DISEASES OF THE STOMACH AND INTESTINES. By Robert Coleman Kemp, M. D., Professor of Gastro-intestinal Diseases in the New York School of Clinical Medicine; Visiting Gastro-enterologist to the New York Red Cross Hospital; Gastrologist to the West Side German Dispensary; Consulting Physician, Gastro-intestinal Diseases, to the Manhattan State Hospital; Member American Medical Association. With 280 illustrations. Some in colors. Philadelphia and London: W. B. Saunders Company. 1910. Cloth, \$6.00.

EMERGENCY SURGERY FOR THE GENERAL PRACTITIONER. By John W. Sluss, A. M., M. D., Professor of Anatomy, Indiana University School of Medicine; Formerly Professor of Anatomy and Clinical Surgery, Medical College of Indiana; Surgeon to the Indianapolis City Hospital; Surgeon to the City Dispensary; Member of the National Association of Military Surgeons. Second edition, revised and enlarged, with 605 illustrations, some of which are printed in colors. Philadelphia: P. Blakiston's Son & Co. 1910. Price, \$3.50.

A SYSTEM OF OPERATIVE SURGERY. By Various Authors. Edited by F. F. Burgard, M. S. (Lond.), F. R. C. S. (Eng.), Teacher of Operative Surgery in King's College, London; Surgeon to King's College Hospital, Senior Surgeon to the Children's Hospital, Paddington Green. Four volumes: Vol. III, Operations Upon the Ductless Glands, Operations Upon the Bile Passages and the Pancreas, Operations Upon the Central Nervous System, Operations Upon the Genito-Urinary Organs, Operations Upon the Thorax and its Contents. London: Henry Frowde, Oxford University Press; Hodder & Stoughton, Warwick Square, E. C. 1909. Price, cloth, \$5.50.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M. D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College, Philadelphia; assisted by H. R. M. Landis, M. D., Assistant Physician to the Out-Patient Medical Department of the Jefferson Medical College Hospital. Volume I. March, 1910: Surgery of the Head, Neck and Throat-Infectious Diseases, including Acute Rheumatism, Croupous Pneumonia and Influenza—the Diseases of Children—Rhinology and Laryngology-Otology. Philadelphia and New York: Lea & Febiger.

MODERN SURGERY, GENERAL AND OPERATIVE. By John Chalmers Da Costa, M. D., Professor of Surgery and Clinical Surgery in Jefferson Medical College, Philadelphia; Surgeon to the Philadelphia General Hospital, Consulting Surgeon to St. Joseph's Hospital, Philadelphia; Fellow of the American Surgical Association, Member of the American Philosophical Society, Member de la Société Internationale de Chirurgie; Member of the Medical Reserve Corps, U. S. A. Sixth edition, thoroughly revised and enlarged, with 966 illustrations, some of them in colors. Philadelphia and London: W. B. Saunders Company. 1910.

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No. 5.

EDITORIAL.

AS TO MEDICAL ORCHESTRAS.

An outlet for the superabundant energy of the modern physician has lately been brought about by the founding at Paris of an orchestra which has only medical men as members. This somewhat novel idea took shape in the minds of a dozen physicians following the performance of Dr. Raoul Blondel's symphony "Le Rêve de Sainte-Thérèse" at one of the Lamoureux Concerts, and so deep was the impression with these twelve musical enthusiasts, especially with Professor Richelot, that there was sufficient talent among the physicians of the French metropolis to start a medical orchestra, that steps towards its realization were at once taken. What must not have been their surprise when the applicants for membership numbered some one hundred and fifty and the leader of the orchestra of the Paris opera-house volunteered his services! But such was the case, and already sixty-six medical musicians have been sufficiently trained so that no disgrace shall attach to their first public performance, which will take place some time in May at the Théâtre de l'Athénée, loaned, for this occasion, through the kindly offices of M. Deval.

The question which must arise in all thinking minds is what should be the ultimate purposes of so unique an organization. The French, with their innate regard for the artistic, may not go further in the uses of their orchestra than to give entertainments for the benefit of special medical organizations of the charitable kind in dire need of pecuniary help. But with us, were we to follow in their footsteps, the idea would soon take a more practical shape, since our appreciation of mere artistry is always at a deplorably low ebb on account of carefully-tended commercial activities. Therefore is there anything at present being agitated in high or low medical circles—this distinction is always of paramount import-

ance when the adoption of new and startling innovations is under discussion—that can equal in interest the possibilities of the therapeutic value of not one, but many American medical orchestras, were they to play the right sort of music, as prescribed by a recognized medical director, in the rooms, wards or amphitheatres of our many hospitals? Or in case the patients are not confined to their beds on account of surgical intervention, but are only hosts to the many skin affections which to-day are reaping the benefits of phototherapy and radiotherapy, or for other reasons in need of physiotherapy and mecanotherapy, a public concert would have advantages, since by effecting a foregathering of some hundreds of patients the program could be diversified to bring, not only heat and light into the musical atmosphere, but a stimulation of all the muscles of the body that would put the Whitley Exerciser to shame. Surely modern music, so unmistakably interpretative of all the complicated phases of civilization as expressed in the works of Richard Strauss, Hugo Wolf, Charpentier, and Debussy, would, if handled by a medical orchestra that had the medical and the musical sense in like proportions, be the means of doing away with nearly all the therapies; just as in very recent times these therapies were instrumental in casting ignominy on the worth and value of certain hitherto highly-prized drugs.

What, for instance, could be better as a substitute for mecanotherapy than Strauss's latest musical contribution, *Elektra*, with its undoubted suggestions of muscular action, its appeal to strength of body and of mind, its strange cacophonies to understand which requires more exercise on the part of the auditor than can come to him from many days of persistent limb movement. What more colorful, in a mild sort of way, than Debussy's "*Pelleas and Melisande*," more in line with phototherapy as illustrated by Finsen's Light? Is it a foolish stretch of the imagination to see in the opera "*Salome*," therapeutic qualities allied with radiotherapy, and feel that though the resemblance is not absolute, the day is not far off when some composer will write an opera illustrative of all the high values of radium? And what about the half-forgotten Berlioz, to mention a musical genius of former times, with his thunderous phrases and general ill-temper by which he hoped to convince his contemporaries that he was worthy of their notice? Would not his music, if conducted by a surgeon of light and leading, near the bedside of a patient, be a more effective check to some of the disagreeable set-backs which so often follow operations and which sometimes culminate in collapse, than is realized to-day when thermotherapy is called into play to stop complications that necessitate many uncomfortable hours of unintermitted vigil? In truth, we have here an as yet unexplored country that no doubt will yield rich rewards to those daring spirits in the medical and

musical worlds, who, for aught we know, may already be hard at work on an alliance that shall be the therapeutic boon of the future.

At present the status of musical education among our physicians is not a thing to be too boastful of; hence, the first attempts in the matter of interpreting a musical score should be made in secret lest the execrable playing create an invincible prejudice in the minds of the public against the forming of a medical orchestra. But what is more important to remember is that directly such a body of men are put to work in the sick-room, a musical director of rare judgment is absolutely necessary, for if he be either a thorough musician without any extensive knowledge of symptomatology, or a medical man ignorant of the effect that modern music may have on the sick, no good results will ensue. What would not be the dire consequences of a mistake in judgment that would insist upon the playing of a Richard Strauss or Hector Berlioz composition shortly after a surgical operation, when the soothing tones of a Mozartian score would have greater therapeutic value!

THE ADVANTAGES AND DISADVANTAGES OF A MILITARY MEDICAL CAREER.

A few years ago, medical colleges were quietly telling the students that any man able to pass the examination for appointment into the army, was properly equipped for a much more successful career in civil life, whether success is measured by financial returns or scientific achievement. Even yet there is frequent complaint that the army takes the best students and makes insufficient use of them as far as original work is concerned; for instance, the epoch-making yellow fever investigation of Walter Reed and his associates, was merely a substantiation of a fairly well-established theory of others. It has even been charged that official life has often shown a disposition to suppress the activities of army men and has postponed the acceptance of most important discoveries. Untold numbers of lives were lost because the French military surgeons failed to show the slightest *esprit de corps* when one of their young men, Laveran, discovered the cause of malaria; instead, they practiced the traditional repression of officialdom. Our own Beaumont had to work privately for years on his digestion experiments with St. Martin at great expense, and could scarcely get money enough to publish his book. In spite of this criminal neglect, if not actual official repression, his discoveries and conclusions are still the basis of modern ideas, and but little has been added except in the way of elaboration of details.

Everyone who has had dealings with the officialism of organizations knows the reasons for conservatism. Safety is of such vital importance that innovations cannot possibly be tolerated until they have proved to be improvements, and officials are so bombarded by innumerable fool suggestions of ignoramuses, that rejection of dangerous plans becomes a habit. It is quite natural, therefore, that a really great idea is not recognized and meets the same fate. It is quite natural, too, that "the powers that be" should consider themselves more competent than the subordinates they manage, and resent suggestions of change as reflections bordering upon insubordination. Obedience to authority is the only comfortable course to pursue and it is evident why medical men in any organization should sink into the routine of the machine.

This is probably the reason why the colleges have been so anxious in the past to keep workers out of the army, in order that civilization may be benefited by men who would otherwise lose originality in their subordination to the ideas of others. It is unhappily true that the army man, to be successful, must be a member of a harmonious machine in which the innovator is necessarily a disturbing factor. They must pull together even if some know they are pulling in the wrong direction, and the man who would not pull at all because of his objections, becomes an official outcast. Consequently, organization always has suppressed and always will suppress individuality to the point where loyalty to the machine becomes a fixed idea, and new discoveries are then impossible.

Such an indictment is somewhat overdrawn, because, in the first place, the best students in college are not necessarily the best workers after graduation. Learning what others have thought out is vastly different from thinking out things ourselves. Some men are students all their lives and never do an original thing, while the worker is spurred on by his discontent with what others have done. It is not at all certain that these "best students" are any more successful out of the army than in it. Our medical colleges would confer a favor by finding out the subsequent careers of their best students, and the class-standing of famous and successful physicians. Academic institutions have long known that class-standing does not give the slightest clue as to future success, which comes just as often to the wooden students as the admirable Crichtons. Indeed, many famous successful men of great intellectual power have had considerable difficulty in getting a degree. So it is not a foregone conclusion that the men who enter the army are of the type which makes great discoveries. Probably they do far more than their share of original work, as compared with the star students who enter civil life, but no examination of memorized topics can ever select the best workers. The army does not get the best and is often dreadfully shocked to find itself loaded with the worst.

In the second place, repression of innovators is just as severe in civil as in military life. All new ideas must pass through a stage of vicious attack and then be passively ignored until there grows up in their favor a public opinion which no one can oppose and not lose caste. Restrictions on originality exist everywhere and do no more harm in one walk of life than in another. The man who wants to enter the army to make original investigations, will succeed if he has backbone, but he must not expect to be received as a Pasteur until he has shown by good works that he is one. That is, he must work out his own salvation without official assistance. Those who quit because not coddled, would do no more than make a living if they stayed in civil life and struggled for existence in an unappreciative world.

The tremendous advantage of an army career, is the steady income which relieves one of the labor of this struggle for existence. John Hunter is often quoted as having gone reluctantly to see sick men, and stated he had to have "that damned guinea" or he would turn the case over to some one else. When Uncle Sam gives the "damned guinea" for services not particularly arduous, which leave ample time for investigations, there is every chance in the world to accomplish something, but if a student has not sufficient backbone to work on in spite of lack of recognition, he had better stay out, for he will only have idle time in which to worry over his sad fate of being an unappreciated genius. The emoluments are fairly good, for though not as munificent as those of the guilded specialist or society favorite, they are better than 95 per cent. of the profession. Besides, who knows whether he will be a great success? A certainty is infinitely better than a gamble.

No doubt there is a grave feeling of discontent in the army medical corps, as we have been credibly informed, and always has been. In all organizations, it is natural that a few men should seize the machine, use it for personal purposes and let others do the disagreeable duties. When success is attained in a certain sphere, the feeling arises that no one else could possibly be so good, and there is a reluctance to make a change, though as a matter of fact, when death or accident makes a vacancy in some such special work, it is always possible to find another man to do it as well, or even better. It would be conducive to contentment and efficiency of the whole if these men were willing to do their share of disagreeable work, as in all other branches of the service, but that is expecting too much soldierliness of mere human beings who are far from angelic. For a while at least the new men entering the service must realize that influence of some sort is at the basis of preferment, and a "square deal" unattainable.

In spite of the fact that the army doctor will always find himself

ordered to undesirable work from which others are excused, and always will be until Congress interferes to compel a more equitable arrangement to prevent the inefficiency inseparable from discontent at real or imagined injustice, we still advise young physicians to enter the army. Their chances of success and renown are enhanced for the very reason that they can do more original work than if their strength is used up in making a living. Only the very exceptional man of tremendous energy can do such work in the midst of an exhausting practice, and most of us find that we have barely enough strength to make a living.

The danger of a salaried life position is the very human tendency to cease all activity except that demanded by imperative duty. Neglect is rare because it is followed so promptly by severe punishment, but few men go beyond their mere duty and do mighty little to improve the organization. It is so easy to suffer dry rot and it requires a little more than average energy to keep oneself in a condition of great vigor, unless one has energy exploding all the time like a Roosevelt. The danger is obviated by a system of examinations before each promotion and this takes the place of the struggle for existence in civil life. A man must keep up sufficiently to convince his superiors that he is still in the ring and a very ordinary amount of reading of new and old literature is sufficient for the purpose. Few fail who have so conducted themselves. To be sure, the press has recently animadverted upon a system of examinations which gives no weight to achievements and judges solely by the candidate's memory of the achievements of others. Educators are beginning to consider examinations utterly worthless, for the reason that the best workers not infrequently pass the poorest examinations,—a famous historian once confessed that he was unable to answer the history questions of a civil service examination. But an effort is probably made to formulate army questions which are eminently fair and practical. So no one need dread examinations unduly, though it must be confessed that their tendency is to foster discontent if one is liable to find himself thrust into civil life when he is too old to start anew.

Perhaps the time is coming when the war department will devise a method of obtaining original work from all the medical officers, instead of ordering them to routine duties. Then new ideas will count and the whole corps do something towards creating a corps-mind which will have great weight with Congress and the public, who naturally are a little reluctant to accept as final the opinions of a few favorites. There is so much lay opposition to the glaring absurdities of a medical reserve corps containing so many men utterly ignorant of military duties or too old to go to war, that it may not have been created if Congress had any way of obtaining the expert opinions of the medical officers as a whole. Besides

all this, history shows that an administrative chief is far more successful if he can count on the loyal support of the 95 per cent. of the unselfish, than if they are alienated by injustice. The very selfishness of those who seek or accept favors, prevents their supporting their chief in a situation requiring some self-sacrifice. They are then like broken reeds, and the interests of the nation are jeopardized, as we have seen more than once.

The men now entering the army have a great career before them, and a prospect for a more rapid promotion than ever in the history of the service. Not one in fifty has the slightest chance of being surgeon-general, of course, and a man is a fool to enter with that in view. The top of the ladder is a colonelcy and that does not come in any army until one is well along in years. The prospect of spending one-third or one-fourth of one's life in the tropics is not such a hardship, and many men like the experience.

So far we have been advising those who are dependent upon their own exertions for the necessities of life. To them the needs of existence are imperative and ambitions come last. If, on the other hand, the young graduate has sufficient capital to place him beyond the possibility of actual want, or has ambitions for which he is willing to suffer privations a few years and remain celibate, it would be folly to enter the army and neglect the grand opportunities of civil practice, or the investigation of sciences. Huxley chose the latter.

OPINION AND CRITICISM.

THE RELATION OF THE UNIVERSITY TO THE MEDICAL SCHOOL.

Although in the last issue of this JOURNAL a brief note appeared on the relation of the University to the Medical School, the recent publication of Dr. Pritchett's report, before the joint conference of the Council on Medical Education and the Committee on Medical Legislation of the American Medical Association, warrants a more detailed discussion of this vital matter. The Carnegie Foundation, in association with other interested bodies, has been making an extended study of the strength and weaknesses of medical institutions in the United States and Canada, and the resumé of the results given by Dr. Pritchett abounds in facts so startling, in conclusions so trite, as to demand careful attention. Every once in a while, in the past, harsh criticisms of our medical system have been made, but they have been received with indulgent acquiescence; now when a body of trained investigators spends two years visiting every medical institute in America, its conclusions must be received with thoughtful consideration, and its advice, if sound, followed with active help.

The imposing arch of facts and hypotheses collected in this report rests on the keystone of grave errors in our present system. It has long been realized that there are too many medical schools and too many physicians in this country. This is known not only from the low average income of the doctor but from a comparison with the requirements of other countries. The United States has three times as many physicians as are needed by the community, twice as many per thousand population as England, four times as many as France, and five times as many as Germany. Economic laws of supply and demand apply to all human wants, and where the supply exceeds the demand the quality is poor. The investigators consider this overproduction due entirely to the "low-grade schools," and they further designate as untenable the arguments advanced for the preservation of such schools. These arguments usually have been the necessity of supplying doctors for the rural districts where well-trained men will not practice, and, secondly, of offering an education for the poor boy. The first is answered by finding the "most expensively trained" man in the smallest rural districts, and the second by the facilities offered by good schools, at the same or less cost than those furnished by the poor school. "The argument for the poor boy is in effect an argument for the poor medical school, and it has no reasonable foundation."

Constructive advice follows destructive criticism, and the disease having been found a cure is advanced. The University and the Medical

School must realize their reciprocal relations, and by definite understanding of underlying principles must come to an agreement on detailed plans. To quote from the report: "A university * * * which appreciates the ideals in modern medicine and * * * its own duties and responsibilities, will make itself responsible for the standard of admission to the medical school, for the ideals which govern it, and for the financial support which is to maintain it." Although about half the medical schools are affiliated with universities it is gravely surprising to learn how loose the union is in most cases. Many universities do not demand as high entrance requirements to the medical department as they do for their college,—and this despite the accepted fact of the necessity of a good preliminary education. Another weak place is in the chairs of clinical medicine and surgery. High class practitioners must be the goal of medical education, but the standards of clinical medicine cannot be high until the professors thereof, as in the fundamental sciences, are essentially university teachers and investigators. The man who can only serve small irregular portions of his time to the duties of teaching cannot be a source of inspiration for the future high-class doctor. The third duty of the university—that of financial aid and oversight—has likewise been woefully neglected, but this is not altogether surprising in the light of the general attitude of legislators toward medical finances. It is only within very recent years that the State has seen the necessity of spending money for public health or medical education.

The final appeal to the institutional patriotism of the medical schools, and to professional patriotism of medical men, must stir the high sense of honor which men in medicine are supposed to possess. The school should arise above local ambition, false ties should be broken, and only the highest ideals striven for. The individual physician must remember that his duty to the profession is higher than personal interest, and that an ultimate ideal may cause some sacrifice. If the findings of the investigating committee are heeded, those who are interested in the greatest good for the greatest number will find a good cure for many of the present medical educational ailments.

In the consideration of the medical school Pritchett has included the hospital as an integral part; but unfortunately many excellent hospitals do not form part of teaching schools, and very many schools do not have adequate hospital facilities. A celebrated American physician, well known for his efforts in making ward teaching an essential in the curriculum of third and fourth year medical students, once said: "I desire no other epitaph than the statement that I taught medical students in the wards, as I regard this as by far the most useful and important work I have been called upon to do." Such teaching with the patient as text, such actual contact with disease, on the part of the student, is worth more than a book of didactic lectures, and it is only in this practical way that the budding young practitioner can become really equipped for the actual handling of patients. Aortic insufficiency was described in detail by Corrigan from the careful observation of a single case. But the student is by no means the only gainer: the patient receives better attention and more careful study, the hospital gets more complete records, and the

interne gets the benefit of the scientific curiosity of younger men. Consequently it would seem a good thing, all around, if all first-class hospitals were used for clinical teaching. Hence one reads with joy the announcement that there has been an agreement between Mt. Sinai Hospital, the German Hospital, and Columbia University of New York, whereby clinical instruction will be given in the wards of the hospitals to the students of the medical department of the University. The time will undoubtedly arrive when such announcements will no longer attract attention, but at the present stage each step in the process must be considered, if only to draw attention to the good which must emanate from such unions.

This discussion cannot be ended without brief reference to the reorganization plans given out by the University of Pennsylvania. Philadelphia, one of the oldest and strongest medical centers in the world, has found the need of changing many parts of the medical training offered to her students. The department of medicine is reorganized with Edsall, a type of the "laboratory-clinician" in the chair, and a new department of Research Medicine is started with Pearce in charge. Several of the other branches are also to be entirely changed. It is a rather interesting commentary on the awakening of American Medicine to her new needs that three such important factors should be brought into the lime-light practically at the same time.

LITERARY NOTE.

What strikes one at once upon reading Dr. James Peter Warbasse's latest contribution to medical literature, "The Conquest of Disease Through Animal Experimentation," is the directness of the writing and the sincerity and honesty of the author. The very first chapter, *The Study of Living Animals*,—a matter of three and a half pages,—is luminous enough to let the reader know without any circumlocution just what is the author's mental trend and the problems he sets before him to elucidate in the succeeding chapters. His plea for the study of the biologic sciences is well made, and the fact of its having been neglected in our college curricula is surely not the brightest chapter in our general education. For without a thorough understanding of the biologic sciences we cannot appreciate the purposes of animal experimentation and the great benefits accruing to mankind therefrom. While the book is in no way a reply to the attacks made by militant antivivisectionists, it is, nevertheless, an excellent contribution to the only side of the controversial discussions so prominently now before the public—the side that has for its strength a statistical array of glorious facts that down at once the cheap sentiment of the small army of so-called humanitarians who rush into print at the slightest whimper of some animal. From a literary standpoint Dr. Warbasse's book invites only the friendliest criticism, since unlike most productions that come from the pens of physicians it is neither turgid with technical expressions nor overweighted with interminable sentences "that come to an end only by the grace of God."

ORIGINAL ARTICLES.

THE PROGNOSIS IN OPERATIONS FOR APPENDICITIS.

By MAURICE SAVARIAUD, M. D., of Paris.
Surgeon to the Hospitals of Paris.

The prognosis in operations for appendicitis varies according to the time when the operation is performed—namely, whether it is an interval one or one occurring during a crisis of the disease. In the operation generally known as the interval one the mortality is light. Now the important matter to remember is to differentiate, with the utmost care, between cases in which the appendix is free from adhesions, and the cases in which it is so closely united to the surrounding parts that the surgeon is compelled to dissect it away from the adhesions. In the former we have a slowly developed appendicitis of the mucosa variety, since the inflammatory processes have not passed beyond the appendicular mucosa. The mild crises which evidence the disease are characterized by pain at McBurney's point; and when these are synchronous with an enterocolitis the diagnosis is attended with some difficulty, due to the fact that it is far from easy to distinguish between them and an inflammatory condition of the colon. Of course it is not difficult to recognize the presence of an enterocolitis when there is diffuse pain along the large intestine; when in the feces there is mucus more or less discolored by blood; but though all this be granted can one say with justice that in the intestinal disturbance the appendix played absolutely no part? If the difference between appendicitis and enterocolitis were as distinct as is claimed by Dieulafoy, the question could be easily disposed; but with our knowledge of the fact that enteritis does not preclude the presence of appendicitis, and, furthermore, on account of the absence of a surgeon during an attack of enteritis probably accompanied by an appendicular crisis, it is most difficult to say whether or not the appendix was affected. Under these circumstances, should the surgeon wait for a second attack that would be more authentic than the first? Since the removal of the appendix in these circumstances is without danger, it were well to advocate the operation at once, for by so doing a preventive measure against future accidents is effected.

Perforation of the appendix is of such gravity, and the removal of this organ, when there are no adhesions, is so thoroughly simple, that without

any great scruples a surgeon can advocate surgical interference whenever there is a suspicion that this special organ has been involved.

When, as happens in some cases, there are indications of a peri-appendicular abscess (fever, abdominal rigidity, prolonged pain) during a number of days or during one or several weeks, and these indications disappear altogether, the condition obtains for an interval operation. In this sort of case, if the surgeon interferes too soon after an attack—that is to say, less than two months—he is liable to find strong, bleeding adhesions as well as the remains of the abscess. The operation under these circumstances is to be dreaded on account of its length, great care being necessary to cope with concealed hemorrhages, perforation of the bowel, and subsequent suppuration. Even peritonitis may be one of the sequelæ. Free drainage must be insisted upon but even though this important precautionary measure may be followed out to the letter, recovery is most tedious. The advice to wait the longest possible time after an acute and serious attack cannot be emphasized too strongly, as well as the prolonged use of ice, rest in bed and attention to diet. Unfortunately when patients are subjected to this treatment they grow thin, and the surgeon is compelled to remove restrictions from the diet. At the end of a month of absolute quiet a patient may be allowed to get up and resume some of his avocations; but the operation for the removal of the appendix should not be undertaken until about three months have elapsed. When this rule is followed the surgeon is often agreeably surprised to find the appendix free from adhesions and a confirmation of the previous diagnosis of the presence of an abscess during the acute attack.

Among the complications which may arise as a result of removal of the appendix in the interval, it is important to mention rupture, which results in leaving the extreme end of the appendix adherent to the iliac fossa, thus necessitating drainage of the wound at a point from which suppuration is slow to disappear. Rupture in appendicitis is inevitable when the appendix has been perforated near its center by a concretion. Upon dissecting the appendix it tears, and the concretion escapes into the wound; an accident which must be considered a disaster or, at best, a grave complication.

When the extremity of the appendix ruptured in this fashion is lost behind the ascending colon and the peritoneum of the iliac fossa, it is incumbent on the surgeon to give up tracing it through McBurney's straight incision. Fortunately it suffices to drain the wound; nevertheless, this complication is not in any way reassuring. The retrograde extirpation of the appendix and its subperitoneal extirpation should be part of a surgeon's knowledge, for in difficult cases recourse is had to them.

The operation during a crisis has distinctive points, the appreciation of which is indispensable to the success of surgical interference. *Imprimis*, we should consider in detail the early operation performed within a few hours of an attack, and the retarded operation, whether there be an encysted abscess or a peritonitis.

The early operation during the first hours of an attack is rarely done on account of the obstacles placed in the surgeon's way by the family, despite his sincerity in advocating it at once. But is it wrong to add that the infallibility of this sort of operation is yet far from being proved? Even for the cases which develop slowly this procedure has no advantages because only too often there is no corroboration of the diagnosis but an exemplification of the uselessness of the operation. In serious cases, in gangrenous appendicitis, for instance, this method might be considered ideal, but when admitting this the thought should not be lost sight of that the operation must be done with celerity, within 12 hours of the initial attack or, at least, within 24 hours. Beyond this time, the operation assumes a sinister aspect, and I retain to this day the bitter memory of a case in which a gangrenous appendicitis that had already become encysted, succumbed very rapidly to an operation performed 36 hours after the seizure.

When there is an abscess in the process of forming, the operation is not only always serious but its prognosis is most dubious, since no surgeon can say with certainty that he will be able to evacuate the pus without opening up the peritoneum. Beyond a doubt, when the pus is in direct contact with the parietes, and, especially, when the abscess bulges plainly into the rectum, one incision with a bistoury will open it freely and effect a cure. But these very simple cases are relatively rare, and my experience has been that not infrequently an abscess though deep—retrocecal, retro-epiploic or mesocoliac—may be concealed by the great omentum. But in all the other cases in which the surgeon is compelled to penetrate the healthy peritoneum so that the abscess may be opened, the prognosis is exceedingly problematic, and it were much better to protect the great omentum by means of compresses. The operator should also try to isolate the appendix by means of sutures connecting the cecum with the parietal peritoneum, according to the teachings of Duret, and essay to incise the retrocecal abscess by making a way outside the peritoneum, as is done when the iliac artery is ligated. Here also the prognosis is grave, and autopsies have often demonstrated that the operation really brought on the accident that the surgeon had greatly desired to avoid—namely, the rupture of the abscess into the peritoneum. This rupture, or at least extravasation, may even occur when the patient is moved from his home to the hospital, or while preparations are making for the operation, on account of the extreme fragility of the parietal boundaries of appendicular abscesses; a fragility which is due to the characteristics of the anærobic microbes, since these micro-organisms sphacelate the tissues but do not cause the formation of thick, false membranes.

The prognosis then in operations for general appendicular peritonitis is always extremely grave. It is somewhat less so if the operation occurs in the early stages of the disease, and appears to have its gravity lessened when the peritonitis reverts to an unmistakably inflammatory state, with

violent reactions on the part of the system—fever, vomiting, and the febrile facial expression.

On the contrary, the prognosis in cases of toxic peritonitis is nigh fatal, since this manifestation of the disease kills in the same manner as the other infections with which it has often been confounded—namely, peritonitis with hypothermia, rapid decomposition of the intestinal tract, anuria, complete arrest of the feces and gases, and a pulse that is hardly perceptible. Under these untoward circumstances failure following an operation is about the only result. The irrigation or non-irrigation of the peritoneum, the manner of drainage, the position of the patient during the operation, the various subcutaneous injections, and the other means advocated to ameliorate this dire situation, are in my opinion of indifferent value.

My conclusions, after due study of appendicitis, are that it is much better to prevent an attack than to attempt a cure. Awaiting the day when it will be the proper thing to remove the appendix from everyone so as to do away with the disease altogether, I would advocate at present that when the appendix yields the slightest suspicion of being affected, its removal should be enforced.

THE CARDINAL PRINCIPLES FOR THE SUCCESSFUL FEEDING OF INFANTS.

By THOS. MORGAN ROTCH, M. D., of Boston.
Professor of Pediatrics, Harvard University.

So many questions regarding the feeding of infants on laboratory modifications are continually being put to me that I have thought it might be of use to the general practitioner to have the cardinal principles on which to rest the entire field of substitute feeding expressed in a paper on this subject.

The human infant thrives best on milk, rather than on any other food. This is usually true in regard to the first 12 months of life.

Question. Does this mean that no ingredient, such as barley water or any of the cereals, should not be put in milk when used as a food for infants in the first year?

Answer. In a general way it does mean exactly this, but not as a universal rule; that is, there are exceptions which prove this general rule.

Q. What are these exceptions?

A. In the first place, it must be understood that the actual age of a human being in months is only a general guide for the kind of food, the amount of food, and the percentage of the special ingredients of the food which should be given to it. Young infants all through their first year vary in their degree of development, not only anatomically, but physiologically. One infant may support its head alone, or may sit up or may creep or stand unsupported, with the differences of weeks and even months in time from another. In a like manner their functions, especially in regard to digestion and to nutrition, may vary in regard to development to the same degree as to time.

Following the rule that functions cannot be safely forced and should not be used until they are ready to be used, an infant should not be forced to sit or stand until its anatomical development is such as to warrant the use of the functions of sitting or standing. In a like manner the amylolytic function of the infant should not be forced to convert starch into sugar before this function is sufficiently developed to warrant its use. As a rule this amylolytic function is not developed to any great degree before the 11th or 12th month, and therefore as a rule the giving of starch before the 11th or 12th month is contraindicated. In support of this fact, also, is the example which nature presents to us, in not only showing that on nature's food, breast milk, young human beings are better nourished than any other during the first 12 months of life, but also that human milk has never been found to contain starch in any form. It is a poor argument to say that we know of certain infants who have

thrive on starch, and that, therefore, starch should be given in the early months of life. When they do thrive it is because the development of their amylolytic function is more advanced than usual, and in this sense they are merely the exceptions which prove the rule.

Q. Does this rule of development hold good with the elements which always exist in milk?

A. Yes, it does. The infant in the course of its development gradually has its power of digesting the fat, sugar and proteid content of the milk grow.

Q. How do you know when an infant needs to have starch in its food, —since you say that it ought not to have starch in the early months and yet it is under 11 months?

A. If the infant's nutrition evidently shows that it needs some other food besides the elements of milk to make it gain, even though it is digesting these elements in high percentages, then you must suspect that its amylolytic function is in an advanced stage of development and carefully try giving it starch, as will be explained later in this paper.

Q. Is there any choice as to the kind of milk which should be used in feeding infants and young children?

A. There certainly is. In the first place every milk contains the same food elements; but whether it is that obtained from goats, or asses, or cows, it must be changed in order to adapt it to young human beings. Therefore, the question of supply does not depend on the kind of animal, but on the quality of the milk, and the utilizing of the special animal which is most commonly used in the country in which you live: in Italy, for instance, the goat; in America, the cow.

Q. What are the differences in quality which you speak of?

A. Different breeds of cows differ as to a high or low percentage of the fats, sugars, and proteids in their milk, but this makes no practical difference, as these percentages have at any rate to be changed to suit the individual infant's digestion. The quality of the sugar and of the proteids in the milk of different breeds of cows, so far as we know, differs but little. On the other hand, the fats differ very greatly. So far as we know this difference exists in the proper proportion of the stable glycerides in the fat to the volatile glycerides. The volatile glycerides are what are most likely to produce indigestion, therefore, the milk which in its fat content shows the smallest proportionate amount of volatile glycerides is best suited for infant feeding. It is also to be noted that human milk shows a small amount of volatile glycerides while Jersey milk shows a high amount. It is also to be noted that the fat in Holstein milk contains less of the volatile glycerides than in any other breed of cows, and approaches in this particular that of human milk more nearly than does any other milk.

It is also to be noted that the emulsion in Holstein milk is much finer, less easily disturbed and more easily restored than that of any other breed, and that in this respect it resembles the emulsion of human

milk more closely than it does that of any other milk. When possible then use Holstein milk in feeding infants. When you cannot obtain Holstein use the milk of any of the common-grade cows, such as Durham, Ayershire or Devon, but never that of the high-grade cows, such as the Jersey.

Q. Should the milk of one cow be used preferably to that of a herd?

A. No, as a rule; since if anything deleterious happens to the milk of one cow it is more likely to disturb the infant's digestion than if it is mixed with the unaffected milk of a herd. There are instances, however, where the milk of one cow happens to be the most advisable to use; for instance, where the family can only afford to keep one Holstein, or where in the herd of cows only one is a Holstein and the others Jerseys.

Q. Is there anything else in connection with the milk to be considered?

A. Yes, there is a great deal more. In order to insure the success of the feeding certain factors are essential in this really very complex problem. Remember that as a rule cheap milk is dangerous milk for the infant. Economize in other ways, but not on the infant's food. To put on the market a milk which is in every way suitable for young human beings is an expensive undertaking. Recognize that a good thing must cost a good deal and do not hesitate to pay high prices for the infant's milk. Drink, if you choose, or cannot afford to do better, the poor milk yourselves. The conditions which you should require are (1) an honest milk dealer whom you can trust to give you what you are paying for; (2) a clean cow stable; (3) clean milkers; (4) healthy cows tested for tuberculosis; (5) absolute protection from dirt and bacteria, and rapid delivery from the time of the milking to the house of the consumer; (6) absolute care to keep the delivered milk cold and clean in the infant's home; (7) absolute cleanliness of bottles, nipples, and hands of the person who feeds the infant; (8) the proper intervals of feeding varying from once in 2 hours at first, gradually increased to 3 hours, not according to the age of the infant, but to its development, since infants of the same age may have different sized stomachs; (9) care to have the milk warmed from 98 to 100° F. and kept warm with a cozy throughout the entire feeding.

Q. How do you determine the amount to be given at each feeding during the year?

A. You should always begin with a little less quantity than which you think the infant will take, even if the infant seems hungry at first. You judge of its development and progress in development, in a general way, by its weight. In most cases, starting with 1 ounce gradually increase to 2 ounces in 2 months, then 3 or 4 ounces, and by 6 months, 6 ounces, and by 8 months or 10 months, 8 or 10 ounces, but always watch the weight, the increase of which should be about 1 ounce a day for the first half year and one-half ounce in the second half year. The large babies over 7½ pounds at birth usually show a higher development and should be fed correspondingly larger amounts. These rules, however, are only

general ones and are for perfectly healthy infants. Remember that successful feeding means careful attention to and an intelligent understanding of each link in the chain, which leads from the source of supply (the cow) to the consumer (the infant). Any inattention to the details of any one of the links in this chain throughout the whole year endangers the success of the feeding.

Q. What is modified milk?

A. Where any change whatever is made in the milk as it comes from the cow, whether by adding water or anything else or increasing or lessening any of the constituents of the milk is called modification.

Q. You say that milk always has to be modified for infants in the early months of life according to the development of the special infant. How is this modification best accomplished?

A. By having the modification made in a thoroughly equipped milk laboratory by milk-modifying clerks who have been carefully trained for such work.

Q. In what ways are the laboratory modifications better than those done in the homes?

A. In almost every way. In the first place, the mother or the nursery-maid lacks the training in exactness in comparison with the trained laboratory clerk. Then you must understand that there are so many conditions to be fulfilled in determining the amount of cream, water, milk, sugar, and alkali to be used in the mixing of the food that you have a complex mathematical problem to deal with. Different creams differ in the percentages of the fat which they contain, so that you not only have to know what fat percentage is represented by the cream which you are using, but also how to deduce from that percentage the fat percentage which you wish to have in your mixture. Also that with certain fat percentages in your cream you can only obtain certain (not all) combinations of the other elements which you may wish to have in your mixture. Again, that it is not alone the simple whole proteid which in many cases you have to calculate in your mixtures, but certain percentages of the casein and of the whey proteids, each in itself and in combinations with each other. There is no question, therefore, but that for exactness and simplicity, simply writing a prescription for a combination of percentages of each of the elements of milk, fat, sugar, casein or whey proteids, the laboratory modification is far superior, for all the mathematical calculations are made for you by expert mathematicians in the laboratory, and the mixtures are under the absolute control of the prescribing physician.

Q. What must we especially know in order to feed infants well and in a way which will employ all the modern exact methods which are known?

A. You must first make an accurate diagnosis of the kind of case you are dealing with, and, secondly, whether you are dealing with normal digestion. If so, what the stage of development is, for indigestion

will arise if in a normal digestion in an infant 6 months old with the development of 4 months, you give a strong food adapted to a 6 months' development; or, on the other hand, if you give an infant 4 months old with a normal development of 6 months, a 4 months food, the infant may digest but will not thrive. Again, you must determine whether the special infant has an idiosyncrasy which prevents it from digesting certain elements in the milk or certain combinations of elements which a normal stage of development would ordinarily digest well. The whole question of feeding then is to fit the food to the special infant and not attempt to give simply the average food for an average group of infants of the same chronological age. This is accomplished by changing the percentages of the fats, sugar, and proteids, according to the individual digestion in both health and disease.

Q. Why is the percentage method used?

A. Because it is a simple, clear and precise way of stating and knowing what is present in a prescription in a decimal form, similar to interest rates. For example, a man is not satisfied to know that the income from \$109 is \$5.45, he changes it to percentages and says it is earning 5 per cent. In a parallel way this shows the advantage of dealing in percentages when estimating the contents of a milk mixture.

Q. How is a physician to know what percentages to start with in a special case?

A. There are certain general phases of the question to be understood first. The problem is to use the elements of the food stuffs—sugar, fats, and proteids—so that they can be digested and have a sufficient caloric value for nutrition. In an individual case you cannot at once say what combinations of percentages will accomplish this. You, therefore, start with low percentages and then gradually increase each element in turn, so as gradually to attain a percentage combination of fat 3 to 4 per cent., sugar 6 to 7 per cent., and proteids 1 to 2 per cent. If the infant is digesting well and is gaining steadily in weight, this shows that the percentages and caloric values of the food are correct. These percentages are then retained until towards the end of the year, when they are gradually changed until they are similar to the whole or unmodified milk. For example, in a premature infant it is safe to start with 1 per cent. fat, 5 per cent. sugar, 0.25 per cent. whey proteid, and 0.15 per cent. casein. In an infant at term you may start with 2 per cent. fat, 6 per cent. sugar, .50 per cent. whey proteid, and .25 per cent. casein. In either case gradually increase the fat to 4 per cent., the sugar to 7 per cent., the whey proteid to .80 per cent., and the casein to .75 per cent. About the middle of the year an undivided proteid of 1 per cent. can be substituted for the divided proteid. Towards the end of the year gradually increase the proteid to 3.50 per cent. and reduce the sugar to 5 per cent. After this whole cow's milk can be given and a cereal can be added to the food.

Q. Why not increase all the constituents of the food at one time?

A. Because in case the increased percentages cause indigestion or the

infant ceases to gain in weight it is far more difficult to determine whether one or all three are at fault, whereas if they are increased separately it is known at once which one is at fault.

Q. Is there any other way of determining which of the percentages is at fault?

A. Yes, in part by noticing certain symptoms which follow improper percentages of the different constituents, and in part by observing the character of the fecal contents and having a chemical examination made of them.

Q. What general factors are to be borne in mind as to diagnosis and treatment?

A. You must remember *first*, that the object in view is to make the infant gain in weight, but that this does not mean that such gain always satisfies the required conditions for a perfect nutrition. An infant, for instance, when fed on condensed milk, which has a very large amount of sugar (sucrose) in it, may gain rapidly in weight from an increase in its fatty tissues, but its metabolism may be so affected that the proper nutrition of the bones and muscles is interfered with and it develops rachitis. *Secondly*, you must therefore in your diagnosis carefully consider all sides of the question by first seeing that the digestion is good, (even if while making it so, there is some loss in weight), and then after studying the clinical and chemical signs in the case gradually by decreasing the percentage of whichever element, fat, sugar, whey proteid, or casein, is at fault and increasing the others, provide a suitable caloric value of the food, which will then make up the balance on the side of nutrition and in this way accomplish a normal metabolism for the individual case.

Q. What are the clinical and chemical signs which you speak of?

A. Lack of nutrition is shown by a failure to gain in weight or where there is a loss of weight. The symptomatology of indigestion is very unsatisfactory and often vague, since in the early months of life the nervous system is in such an unbalanced condition that many different causes produce the same symptoms, and one cause may produce many symptoms. The examination of the fecal contents, on the other hand, as expressed by the advanced and admirable work of Dr. Fritz T. Talbot, shows us in many cases exactly where the fault is and enables us to remedy it. What we practically have to deal with, whether in normal or abnormal digestion, is the detection of too little or too much fat, sugar, and proteids in the food. I shall therefore take up each of these elements of the food in succession and state what we know in regard to them. In other words, what we are aiming at is to determine what constituents of the food are not being utilized or are disturbing the digestion, and then by lessening the percentage of the disturbing factor and as soon as a normal digestion is thus restored, increasing one of the other constituents so as to keep up the caloric and nutritive value of the food, thus carrying out a common sense and intelligent treatment.

Q. Before speaking of abnormal signs would it not be well to describe what is the characteristic appearance and condition of the normal fecal discharges in infants, during the first year of life, who are on milk mixtures from the bottle ?

A. Yes. They are smooth, homogenous, semi-solid, not formed, of different shades of yellow, according to the greater or lesser amount of fat in the mixture, and have a weakly alkaline, amphoteric or neutral reaction.

FATS.

The fat-digestion of early life varies considerably at the same chronological age, probably from different degrees of development of the physiological age. The special percentage of fat in an infant's food should therefore be adapted to the special fat-digestion. In endeavoring to rectify a carbohydrate indigestion, and, at the same time, to keep up the caloric value of the food, we must remember that there is danger of developing acid intoxication by replacing the carbohydrates entirely by fats, but that a certain degree of such replacement is valuable and often indicated. In a general way, it may be stated, that the nutrition which is dependent on fat suffers when the percentage of fat in the food falls below 1, and that the digestion suffers when the percentage of the fat is above 4. Butyric acid fermentation may result directly, from the glycerides of the butyric acid being broken up. It is, of course, known that butyric is one of the volatile glycerides. You should understand that vomiting as a symptom, and, in fact, almost the only symptom which in most cases suggests functional disturbance of the stomach, is not an entirely gastric symptom. It is indeed well known that disturbances of the intestinal tract, whether from organic or functional causes, may produce reflex vomiting without a disturbance which could be called gastric occurring in the stomach. It is, in a general way, that an *excess* of fat, beyond the capability of the individual fat-digestion, is prone to cause spitting up, or regurgitation, or vomiting of soft flaky curds shortly after taking the food, and the eructation of gas, of a butyric, cheesy or rancid butter-odor. Ordinarily, however, there is no odor at all, or not much odor to the breath. There is at times distaste for food and rather frequent discharges. The discharges are gray or white in color, dry or of creamy consistency, acid reaction, and of a rancid odor. There is usually very little gas formation.

CURDS.

It must be remembered that there are two distinct kinds of curds, which in indigestion may occur in the fecal discharges. One of these is derived from the casein and is large and tough; the other is derived from the fat and is small and soft.

CARBOHYDRATES.

There are five different classes of carbohydrates which can be used in infant feeding. (1) Lactose (milk sugar), (2) Maltose (malt sugar), (3) Sucrose (cane sugar), (4) Dextrose (grape sugar), and (5) Starch. The explanation of many of the successful results in infant feeding lies in the special carbohydrate which is embodied in the food. Dextrose, however, is the only one capable of being to any extent absorbed into the circulation. It, in fact, represents the final product into which the others are changed before they are ready to be used for nutrition. We should understand that while in almost all cases lactose is the sugar which should be used, yet where there is an excess of lactic acid from lactic acid fermentation we should for a time substitute maltose for lactose. The reason for this is that the relative rapidity of conversion which the sugars undergo in their transit to lactic acid fermentation, lactose, arrives at such fermentation much sooner than does maltose. Where, however, butyric acid fermentation is in excess, lactose is indicated in the food as being the least rapid of all the sugars in its conversion by such fermentation.

Q. How do you know when lactic or butyric acid fermentation is present?

A. The only way that at present I know of is that where it is lactic acid there is a sharp acid odor of sour milk, while where it is butyric acid the odor is cheesy and like that of rancid butter.

The symptomatology of disturbance from either the quantity or quality of sugar is very indefinite. Vomiting when present seems to be due to lactic acid. There is considerable gas due to carbon dioxide. The sugar is changed to lactic acid and then yields carbon dioxide, which is without odor.

The fecal movements are usually loose, very acid in reaction, often causing excoriations of the skin around the anus, and the odor is sour from lactic acid fermentation. The color when the carbohydrates are in excess is brown or greenish. The supposition in these cases is that when acid fermentation with its supposedly sour odor is present a reduction of the percentage of sugar is indicated. A few facts in connection with the last carbohydrate which I shall speak of, *starch*, is important to remember if we are to use this food-stuff intelligently. First, it should never be given before the amyolytic function is far advanced. Secondly, when given it should be for two purposes: one to break up the coagulated casein and the other for nutrition. In the former case there is usually no need of it, as the casein, as will presently be shown, can be given in such small percentages that there is no need of breaking it up by mechanical means. In the latter it must be remembered that in order for starch to be utilized as a nutrient it must tax the digestion, in its preparation for absorption, more than any of the other carbohydrates. The chemical explanation of this is that starch has to be converted first into dextrin, then into maltose, and then into dextrose, which for assimilation

is the end process; on the contrary, lactose, for example, is converted directly into dextrose. We should also note that when starch is given as a nutrient the maximum amount which can be prescribed is about 1.30 per cent. A few drops of Lugol's solution on the fecal movement by turning the starch blue, if present, can be seen under the microscope.

PROTEIDS.

For purposes of feeding we can assume that the proteids in milk are made up of whey proteids and casein. So far as the former are concerned it is doubtful whether, except in unusual cases, they produce any disturbance. The latter, however, is well known to cause a great deal of disturbance. It was, therefore, a great advance in prescribing proteid percentages in laboratory prescriptions to be able to write for certain percentages, in laboratory prescriptions, of whey and casein.

This division of the proteids accomplishes in the most rational way the control of such cases as have difficulty with their proteid digestion, usually through the casein, and yet need a higher percentage of the total proteids for their nutrition. By dealing with the proteids in this way we are enabled to give exactly as much casein as can be digested in the special case. The following table shows the possible combinations of these proteids where the percentage of fat in the food varies from 1 to 4 per cent. and that of sugar from 4 to 7 per cent.

Whey Proteids Per Cent.	Casein Per Cent.
0.25	0.25
0.50	0.25
0.75	0.25
0.75	0.50
0.80	0.25
0.80	0.50
0.80	0.75
0.80	0.60
0.80	0.90
0.75	1.15
0.60	1.25

In the disturbance of digestion by the fats and carbohydrates an increase of proteid percentage can be made in order to meet caloric needs, but on general principles it is wiser to keep the percentage of the proteids down to near the average need, because metabolism of the proteids requires more expenditure of energy, and the products of proteid metabolism are more difficult of elimination than are those of the fats and carbohydrates.

The symptoms of an excess of proteids are vomiting of large tough curds, and pale green and white movements containing more or less

large tough curds having frequently a marked odor more or less foul, according to the degree or kind of the fermentative processes going on, and whether there is much albuminous decomposition. In these cases a strong alkaline reaction suggests proteid putrefaction. The chief principle to be carried out in the treatment of proteid-indigestion is to keep reducing the percentage of casein, but if this is not sufficient the difficulty can usually be obviated by peptonization to the extent which we may wish, and this is regulated by knowing that 20 minutes gives a decidedly bitter taste. It is probable also that excess of one food-component may so change the digestion that another component may appear in the movements. It is probable also that an excess of one of the food-components at the expense of the others may supply a medium suitable for the overgrowth of certain of the bacterial flora, and that such a predominance of one species may cause indigestion. In this way one of the food components may cause indigestion of another.

Q. On what principle are alkalies added to the food mixtures?

A. In the first place we should understand that there are two reasons for producing a greater or less alkalinity in a food mixture, and that both are closely connected with the effect which they have on casein. (1) A moderate degree of alkalinity is sufficient to favor the production of hydrochloric acid in the stomach and thus aid in the digestion of casein. (2) We can relieve the stomach from its work in connection with the digestion of casein by adding a lesser or greater amount of alkali. This alkali, however, in the mixture, must be proportionate in this latter case to the amount of milk and cream used in the mixture, as it is in these ingredients that the casein, which you wish to affect, exists.

These different percentages of the alkali for its double purpose have been carefully calculated and are as follows: Taking one of these alkalies, lime water, as an example, 5 per cent. in the entire mixture will produce a slightly alkaline reaction, 20 per cent. of the milk and cream used assists in the digestion of the casein by delaying partly its coagulation in the stomach and passing it on to be taken care of in the duodenum. If 50 per cent. of the milk and cream used is added to the mixture, all action of the stomach on the proteids is suspended, and this procedure is found very useful in bad cases of gastric indigestion.

Q. Of what special significance are the other alkalies used, such as salts of soda?

A. In the first place it should be noted that casein is a neutral organic compound forming both acid and alkali combinations. This leads to the consideration of the effect upon casein of various alkalies. To illustrate: citrate of soda, which though not an alkali, but so far as its results are concerned may take the place of an alkali in connection with the digestion of casein. It decalcifies the casein and as a result the casein is not affected by rennet, and therefore forms with the acids of the stomach soft friable flakes, instead of tough curds. When sodium citrate is used in place of the alkali it requires .20 per cent. to each ounce

of the milk and cream used in preparing the food to facilitate the digestion of the proteids and .40 per cent. to prevent the action of the rennet, and to insure the formation in the stomach of soft curds instead of tough ones. In like manner bicarbonate of soda can be used, as is shown in the following explanatory prescription blank:

R	PER CENT.
Fats.....	
(A) Carbo-hydrates {	
Lactose (milk sugar)	
Maltose (malt sugar)	
Sucrose (cane sugar)	
Dextrose (grape sugar)	
Starch	
(B) Dextrinize.....	
(C) Proteids { whey	
casein	
(D) Peptonize.....	
(E) Sodium Citrate.. {	
% of milk and cream	
% of total mixture	
(F) Sodium Bicarb... {	
% of milk and cream	
% of total mixture	
(G) Lime Water.. {	
% of milk and cream	
% of total mixture	
(H) { Lactic Acid. { 1 To inhibit the sapro-	
Bacillus.... { 2 To facilitate digestion	
of the proteids	
Heat at.....°F.....	
Number of Feedings.....	
Amount at each Feeding.....Oz.	
ORDERED FOR	
.....	
ADDRESS.....	
DATE.....191	
.....M. D.	

For general routine lime water is the alkali which usually answers sufficiently well.

Q. Is it a fact that certain infants cannot digest milk?

A. No, it is not. It must be remembered that as a rule indigestion in the milk-fed infant does not depend upon the fact that the food is milk, but upon improper combinations of ill-advised percentages of the food-stuffs, which make up the special modification used. It is as a rule, therefore, the fault of the physician who writes the prescription rather than of the laboratory which supplies what is called for.

DIRECT TRANSFUSION OF BLOOD—ITS MEDICAL INDICATIONS.

By L. H. HEMPELMANN, M. D., of St. Louis.

The case that suggested this paper was one of pernicious anemia. The patient, a man of 59 years, had had the disease for eighteen months, and had passed through two periods of remission, the last beginning in March, 1909, and lasting about 6 months. He entered the hospital on November 29th, 1909, with the typical blood-picture of a severe pernicious anemia. He was put on the Grawitz treatment with intramuscular injections of cacodyllate of iron, but failed to show any improvement.

A blood examination made on December 16th, two and a half weeks after his admittance to the hospital showed 680,000 red blood-cells, hemoglobin 25 per cent., a few megaloblasts and many normoblasts, together with a great deal of poikilocytosis. He was delirious, bedfast, and refused all nourishment so that his death seemed but a question of a few days.

It was felt at this time that if the patient's condition could be improved, even temporarily, it might tide him over a critical time and enable him to enter upon a new period of remission. With this in view a direct transfusion of blood was proposed to the family, whereupon the patient's son, a husky young farmer, volunteered to supply the blood needed for this purpose.

On December 19th, Dr. H. L. Nietert operated under cocaine anaesthesia, coupling the radial artery of the donor to the median basilic vein of the patient by means of Crile's tube. His general condition had grown even worse than at the blood examination quoted above, the hemaglobin having fallen to 15 per cent. The blood was allowed to flow for 45 minutes, the immediate effect being very striking. Gradually one could see the patient's lips reddening and the nose becoming quite ruddy. The hemaglobin rose from 15 per cent. (Dare) at the beginning to 38 per cent. at the completion of the operation; and the blood pressure rose from 110 to 120 millimeters (Riva-Rocci). The blood pressure of the donor sank from 140 to 130, his condition remaining good.

Following the operation the patient had a comfortable night, although he had a slight chill toward morning. 19 hours after the operation the red blood-cells numbered 1,150,000 and the Hb. 37 per cent. The stained preparation showed an extraordinary variation in size of the red cells, very large cells being very frequent. The nuclei of the polymorphonuclears did not stain well the other varieties taking the stain pretty well. The patient's temperature varied from 100° to 101° throughout

the day, and, although he looked better than for weeks prior to the operation he remained delirious and restless.

On Dec. 21st, two days after the operation, the patient was quite rational, expressed himself as feeling good and asked for food and to be allowed to sit up. The red blood-cells were 1,300,000 and the Hb. 33 per cent.

On Dec. 22nd, three days after the operation, the red blood-cells were 1,300,000 and the Hb. 34 per cent. He felt quite strong and was permitted to sit up in a chair.

On Dec. 27th, 8th day, the red blood-cells numbered 1,296,000 and Hb. 33 per cent.

On Jan. 1st, 1910, 13 days after the operation, the red blood-cells numbered 960,000 and Hb. 30 per cent. He was not feeling quite as well as he had been although he was still up and about, and was quite rational. There was but little poikilocytosis but still the great variation in size noted at the previous examination. The polymorphonuclears stained poorly and there were occasional normoblasts.

On January 8th, 20 days after the operation, the red cells numbered 907,000 and Hb. 25 per cent.

January 15th, the patient not doing well; he has grown weaker and is a little delirious at times; his memory is poor, and he seems discouraged. At this time he had a severe attack of epistaxis which necessitated packing. Following this the patient became discouraged and returned to his home about 70 miles from the city, reaching it safely.

It does not seem rational to attempt to cure pernicious anemia by means of direct transfusion, since giving the patient a fresh supply of normal blood cannot be expected to destroy the hæmolysins which are probably responsible for the disease. It was hoped, however, that it might stimulate the bone marrow, and possibly tide the patient over a critical period until another remission could set in. The operation came up to expectations only fairly well, but it had such a decided effect for a time, at least, that we feel inclined to repeat the procedure in a similar case under like conditions.

Cabot, Crile and others do not recommend transfusion for pernicious anemia, although some of the German authorities recommend the intravenous injection of defibrinated human blood, and report good results from its use. Robt. Lucy (Med. Record, 1909), reports the case of a woman who developed pernicious anemia during pregnancy. She was delivered on August 13th, 1908, and transfused 8 days later with very good results. Two months later the red blood-cells numbered 3,200,000 and the Hb. was 85 per cent. Six months after the operation she was reported feeling entirely well.

Most of the literature on transfusion is devoted to descriptions of tubes, canulas, and the technique of the operation. A discussion of its possible dangers and its indications in medical and borderland cases will

probably serve to bring it to mind oftener, and thus lead to the more frequent employment of this potent remedy.

It has been said that transfusion is dangerous to life from the formation of thrombi and emboli, and through hemolysis of the red blood-cells. Perfection of technique has practically eliminated all danger from thrombosis and embolism, and it seems that the danger of hemolysis has been overrated. Crile, who has performed the operation many times on dogs and human beings, has no hesitancy in saying that it is entirely without danger. He even goes so far as to say that the occurrence of hemolysis in vitro is no proof that it will occur in vivo, and states that he has done several transfusions where hemolysis of the blood of the donor and of the donee occurred in the test-tube without the development of any untoward results. Pepper and Nesbit (*Jour. Am. Med. Assoc.*, August 3, 1907), however, report a fatal case of hemolysis which occurred in a severe anemia after a second transfusion. Perhaps the first operation served to sensitize the patient for subsequent transfusions.

It is almost unnecessary to add that the question of syphilis and tuberculosis in the donor has to be gone into, and the donor rejected if either is discovered.

Crile advises transfusion in alluminating gas poisoning, in severe jaundice and in hemorrhage of all sorts, not only to replace the lost blood but also because it seems that transfused blood has a decidedly stypitic quality. He found, notably in two cases of oozing following a nephrotomy, that the oozing stopped as soon as the patient was transfused. This naturally suggests its use in other concealed or inaccessible hemorrhages, such as hemoptysis and hematemesis, and hemorrhage after tonsillotomy and other operative procedures as well as severe purpura and hemophilia.

Carrel, quoted by A. A. Berg (*Med. Record*, 1909), has performed the operation twice in cases of the hemorrhagic disease of the newly born (so-called). In each case the infant was in a desperate condition when operated upon, but both recovered without recurrence of the hemorrhage.

Crile has transfused twice for typhoid hemorrhage. One patient in a desperate condition was restored to as good a condition as he was prior to the hemorrhage only, however, to die of a subsequent hemorrhage the following day. In the other patient there was no recurrence. A case which I attended last year would have been ideal for transfusion. The patient, a lady of about 40 years, had been ill for about 5 weeks, and had had repeated and protracted hemorrhages; she was recovering from typhoid fever as her temperature was coming down and her sensorium was clearing up; but she was apparently dying of weakness and anemia. A transfusion was considered but rejected as being too experimental for private practice. She died a few days later of perforation. Her chances would probably have been improved by the operation.

Numerous cases have been reported where patients have been transfused with the happiest result, preparatory to an operation for gastric

ulcer, shock being almost entirely eliminated and the patient bearing the operation remarkably well.

Leukemia, Hodgkin's disease, cancer, uraemia, toxemia, pernicious anemia, and the infectious diseases fail to show any favorable influence of the operation according to Crile.

Before concluding it may be said that it is advisable to make frequent observations of the second pulmonary sound during a transfusion so as to prevent a possible dilatation of the right heart; also frequent hemoglobin estimations should be made, in order to be sure that the blood is flowing. The donor is usually able to be up and about the day following the operation, and has entirely regained the blood lost during the transfusion in 6 or 7 days. Of course, the radial artery of the donor is sacrificed but this does not seriously inconvenience him.

Conclusions: The following conclusions seem warranted—viz., direct transfusion is indicated in post-operative hemorrhage, hemorrhage of typhoid fever, gastric ulcer, purpura, hemophilia, hemorrhagic disease of the newly born, illuminating gas poisoning, and possibly in pernicious anemia. It has been found useless in cancer, Hodgkin's disease, uremia, leukemia, and in infectious diseases.

Metropolitan Building.

THE THERAPEUTIC VALUE OF THE CARLSBAD "CURE,"
WITH SPECIAL REFERENCE TO DISEASES
OF THE DIGESTIVE TRACT.

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I feel sincerely grateful for the opportunity of presenting to a wide circle of American medical men a discussion of the therapeutic indications of the waters of Carlsbad. In this connection there recurs to me the words of Paracelsus, that genial medical reformer of the sixteenth century: "Natural mineral springs represent God's prescriptions, surpassing all others in virtue and strength." I do not propose to give a full dissertation upon what this "strength" and "virtue" of the Carlsbad springs mean in every sense of these words,—I could not accomplish so much in the short space allotted me here; rather will I give a description of the broad principles underlying this method of handling certain disease-conditions.

For some centuries the waters of Carlsbad were used, like other agencies in medicine, solely in an empirical sort of way. It was only in the latter half of the last century, when medicine was placed upon the firm rock of cellular pathology, that the true character and manner of action of these waters became a matter of exact knowledge—verifying, however, to a nicety the dogmas which had been handed down from generation to generation regarding them. Coincident with the advancement of modern medicine, balneology has taken its proper position as a scientific department of our professional work, replacing empirical fancies with precise truths, superstition and the fanciful belief in the "spirit of the springs," etc., disappearing in a most proper and "magical" way, never to return to the field of modern balneotherapy. As a concrete example of this state of affairs, we might consider the history of cholelithiasis, for the rôle of the Carlsbad waters in this morbid condition must be recognized to-day by even the most enthusiastic operating surgeon. Our present understanding of the pathology of cholelithiasis is mainly based upon the activities of the operating surgeon who has given us a veritable photograph of the condition by repeated autopsies *in vivo*, as it were, showing that the true nature of the affection is not purely physical but rather biological, arising from an infection in the gall-bladder itself. Gall-stones begin in cholecystitis; their presence and symptoms in the gall-ducts are purely secondary. The numerous experiments of Netter, Gilbert, Naunyn, Erreth and Stolz, Körte, etc., have

definitely established the pathology of this condition. We have learned from these workers that normal bile is practically free from micro-organisms, whereas in cholecystitis, we find in the bile most frequently the bacillus coli communis, and with or without these, streptococci, staphylococci, and diplococci. According to von Neusser¹ there would be no occasion for surgical interference with the gall-bladder or ducts, were there at hand an antibacterial serum for the infective agent, thus effectually getting rid of our "latent" gall-stone cases. These words of von Neusser indicate the importance which he attaches to bacteria in the causation of cholelithiasis. *Inasmuch as infection is the principal factor in the etiology of gall-stones, the logical attack, therefore, against the disease must be an attack against the bacteria causing it.*

The latest researches incline one to the belief that the bacterial attack on the gall-bladder occurs by way of the blood-stream. It is my firm belief that equal importance must be given to the *source* as well as to the *route* of infection. From the almost constant finding of the colon bacillus as the microbic agent in cases of cholecystitis, it is reasonable to assume that in the majority of cases this infection proceeds from the intestinal canal. Whether the colon bacillus gains entrance to the gall-bladder in the more circuitous route by way of the blood stream, or whether it travels directly from the intestine through the gall-duct passages *per continuitatem*, is really of secondary importance. I first called attention² to the connection between cholelithiasis and intestinal catarrh in 1906.

In arriving at this conclusion, I had opportunity to survey an immense amount of clinical material, composed of numerous cases which displayed a wide diversity of subjective and objective findings. I have, moreover, for years made a systematic investigation of the functional activity of the intestinal tract in all gall-stone cases. *I have found in more than half of my gall-stone cases both clinical symptoms as well as objective findings indicating a catarrhal condition of the small or large intestine.* It therefore follows that in dealing with cholelithiasis, we must reckon with the intestinal canal—we must definitely determine its functional stability—availing ourselves, if need be, of the Schmidt method of functional intestinal diagnosis. In this connection it might be well to ascertain just what the therapeutic value of the numerous preparations might be, those products called chologon, ennatrol, choleysin, probilin, etc. Most of these preparations consist of some drastic purgative principle; for example, chologon depends upon calomel and podophyllin; cholelysin holds ennatrol, and probilin contains ennatrol and phenolphthalein. These preparations act simply as drastic purgatives to remove the contents of the irritated bowels, and they have a pernicious influence, if used too freely, by still further irritating the catarrhal condition already present. As for the so-called "oil cures," there is but little to choose between them. In cases handled by oil treatment, we see in the stools round com-

pact masses which are calcium and magnesium salts of the unabsorbed fatty acids.

There is a splendid opportunity for the observation of gall-stone cases here in Carlsbad, for it is estimated that at least 20,000 sufferers of this disease seek relief at the watering-place every year.

Coincident with the change in our understanding of the pathology of cholelithiasis has come marked revision in the principles of therapy, especially in the application of the Carlsbad "Kur." The sum of our revised ideas upon the therapeutics of gall-stones is as follows: *The removal of the stone is no guarantee that the patient is cured of his gall-stone disease. Moreover, simple removal of the stone is irrational treatment and harmful to the patient. The radical therapy of gall-stone disease is the getting rid of the inflammatory condition in the bile passages, not the mere removal of stones.* I took this stand in 1902³ and have reiterated it again and again.^{4/5} *The most essential requirement for the success of a Carlsbad "Kur" is absolute rest during the course of treatment.* Since I have followed out these principles in my work here, for the last 10 years I have seen most brilliant results in this variety of cases. Before that time, the method of treatment—which is now regarded as illogical—was to have the patient drink several glasses of the water from the warmer springs, repeating the same after walking around a great deal. This procedure is now carried out only in cases where we are looking for a prophylactic result—namely, in individuals who have been relieved of their condition of cholelithiasis, and who return to ward off future attacks; in other words, cases that have been absolutely relieved of all subjective and objective signs of this disease. Yet how many painful hours could have been avoided, how many attacks of gall-stone colic prevented, attacks that were hitherto wrongfully considered part of the "Kur," had this policy of rest been followed out in by-gone days, instead of the ambulatory method of free and strenuous walking!

In handling such cases, as detailed in my contribution written in 1902, I insist upon strict reclining in bed for such patients, applying, from 7 a. m. until the noon hour, and from 2 to 7 p. m., cataplasms upon the region of the gall-bladder as warm as the patient can stand. The patient must drink every 2 hours 150 to 200 cm³ (50° to 55° C.) Sprudel. In 24 hours each individual must drink in the neighborhood of 700 to 1500 cm.³ The drinking hours begin at 7 a. m. and end at 7 p. m. The patient must not be allowed to get hungry; on the contrary, he must be given as much nourishment as he desires. This treatment must be carried out, not only until the patient ceases to have attacks of colic but until all pain and tenderness of the slightest degree has disappeared from the gall-bladder region. In most instances, cure occurs in from 4 to 5 weeks of this kind of treatment; only in a very small percentage of the cases is it necessary to continue the treatment for from 8 to 10 weeks. In the smallest percentage of cases it is necessary to operate if after a long period of this regimen there ensues no relief.

There remains still the impression among some physicians and practically the entire public in Carlsbad that cure of gall-stone disease by the water is only accomplished at the cost of gall-stone colicky pains. They do not yet seem to understand that these pains are unnecessary and are brought on by improper advice, by free walking instead of absolute rest, by undue exertion whereby the inflamed and infiltrated gall-bladder, already complicated by an acute circumscribed peritonitis or pericholecystitis, is subjected to still more unnecessary friction with consequent excruciating pains.

The adoption of the present plan of absolute rest and quiet for patients with this disease will redound to the benefit of all who utilize this method, and the waters of Carlsbad will take the high rank in the therapy of cholelithiasis which is properly their own.

Among medicinal agents to be used, besides morphine, I esteem best of all sodium salicylate, first suggested by Stiller. I give it immediately after the attacks for a period of from 3 to 10 days, 3 times daily, in doses of 0.5 gr. This drug is used by a number of physicians at the present time. Among others who report splendid results with it is the Hollander, J. de Groot,⁶ who says concerning it: "My own experience causes me to agree thoroughly with v. Aldor, who carries on the treatment under conditions of absolute rest, etc."

In spite of this now fully proven fact, there are still some observers, among others P. Mayer,⁷ who maintain that gall-stone colics are frequent during the Carlsbad "Kur" and, in fact, are an outward expression indicative of a positive result of the treatment with these waters! Experimental evidence has been offered (Winogradow) showing that colics are not due to the dissolving or loosening action of the water. To my mind the whole solution of the problem will rest upon the carrying out of the treatment of "rest cure." If, notwithstanding this adequate rest cure, the attacks still persist, it follows that we have to deal with the more infrequent cases of cholecystitis complicated by chronic enterocolitis. In such cases, before summoning aid from the operating surgeon, we should try the entire arsenal of internal methods of treatment.

In such cases of cholecystitis complicated by chronic enterocolitis, we should determine the exact nature of the intestinal derangement, whether in the stomach or intestinal tract below it, or both, as to whether there is an atonia ventriculi, or subaciditas or hyperesthesia of the stomach to fluids, leading to diarrhea; thereupon, we should use, not the Carlsbad water by the mouth, but copious rectal irrigations of Carlsbad water. In my experience, these rectal applications of Carlsbad water have been very successful. By application of the water in this way, we may wash out the lower bowel with 1 to 2 liters of fluid, applying afterwards hot cataplasma to the abdomen, without any irritating effects. We obtain good results in this rectal method for the following reasons:

- (1) We can put larger quantities of the Carlsbad water into the system per rectum than per os. This is demonstrable by the fact that after the

rectal application, there is more diuresis than after drinking per os, showing the large quantity retained and absorbed.

(2) The rectal application of water permits the system to take it in, in those cases where the condition of the stomach actually forbids the consumption of any water at all, so extremely sensitive is the stomach in so many of these cases.

(3) The mucosa of the intestine, with the exception of the sphincter canal, is much more tolerant to high degrees of heat than is the mucosa of the stomach, thus permitting one to use water at a high degree of temperature (45° to 50° C.). This degree of heat is especially favorable for cases of cholelithiasis.

(4) I have emphasized the fact that these cases of cholelithiasis are complicated by chronic enterocolitis. Therefore, the close and intimate application of Carlsbad water directly to the inflamed mucous membrane leads to a direct curative result.⁸

It seems almost sheer waste of time and space to dilate upon the specific effect of the Carlsbad water upon the gall-passages. Viewed in the light of our modern concept of the pathology of these parts, the water acts in these cases of bile-insufficiency as an effective agent for the elimination of the infectious material in the gall-bladder. It is manifestly anti-catarrhal in its action. The empirical teachings of the past have shown this to be true, yet these self-same teachings have been corroborated by the exact experimental evidence offered by Winogradow,⁹ who showed that the action of the Carlsbad water influences bile secretion and thins it out.

I wish to speak now of the utility of the Carlsbad water in a field wherein much fame and popularity has been achieved—namely, a large group of stomach and intestinal diseases. That great Russian scientist, Pawlow, the founder of our modern physiological pathology of the digestive organs, has experimentally proven¹⁰ that bicarbonate of sodium has an inhibitory action on the secretory apparatus of the stomach and pancreas. His work and that of his pupils as well, has demonstrated beyond any doubt that the curative action of alkalies lies in the fact that in the presence of alkaline agents, the continuity of the work of the secretory glands is broken, and that in these "pauses" of secretory activity, the pathological process underlying the disease conditions with which we are dealing in these digestive cases undergoes retrogression. As Pawlow puts it, "one can draw a parallel between the action of alkalies in digestive disturbances and that of digitalis in compensatory troubles of the heart."

We can thus see the range of usefulness of the alkaline Carlsbad water in secretory disturbances of the stomach. This has been repeatedly demonstrated by clinical experiences, supported by experimental evidences, together with the light gained from the knowledge of the effect of high temperatures (36° to 73° C.). This is entirely explicable on the

basis of our modern lessons gleaned in a study of physical chemistry, especially along the line of the newer thought on electrolytic dissociation. I will refer only to the writings of Arrhenius on the effects of electricity on dilute watery solutions of salts which are split up in the organism into positive and negative ions. The more diluted a salt solution is, the higher the ionization; the more concentrated it is, the more neutral molecules remain near the ions. Modern physical chemistry ascribes to this dissociation of salt solution an immense physiological influence. According to our present knowledge the physiological action of salt solutions is in close relationship to their dissociation capacity. Zeynek,¹¹ who made a number of experimental researches upon all the Carlsbad spring waters—Sprudel, Mühlbrunn, Franz Josefsquelle—eventually concluded that these waters are dissociated up to 96 per cent., which with their ionization is extremely significant.

I conclude from their blood-hypotonic molecular concentration and from their high degree of radioactivity, that these two factors in the Carlsbad waters must stand in some kind of relationship to their therapeutic value. I shall, however, in this connection, owing to space limitations, only allude to the experiments of Pawlow, and the dissociation-capacity of the Carlsbad water, in explanation of results obtained in therapy. These facts explain fully the remedial effects which I have witnessed in using the water in the treatment of secretory disturbances of the stomach. *These alkaline waters break the continuity of the work of the secretory glands of the stomach, allowing the inflamed (in cases of gastritis) or the irritable (in cases of hypersecretio, hyperchlorhydria, ulcus ventriculi) mucosa an opportunity to throw off the pathological impress.*

We still adhere in discussing the therapy of these waters to a number of the older theories and investigations which are still in force; among which in first order might be mentioned those of Javorski,¹² who showed that whereas a small amount of Carlsbad water given in a case of lowered secretion, subaciditas, will bring up the secretion to the normal, yet a larger amount given in a case of hyperacidity will lower the secretion! Personally I incline to the belief that the entire explanation of the workings of the water must be obtained from the experiments of Pawlow.

The role of the so-called "diets" in the treatment of digestive disorders, in connection with the "Kur," must not be overlooked. Such a regimen was called "Brunnendiät" in by-gone days, to-day seemingly an anachronism, yet we cannot refrain from speaking of it. There was a time when it was thought that each spring required its drinkers to take a certain diet. That is now a matter of history. To-day the dietetic treatment of cases treated in Carlsbad is better regulated along more scientific lines. Strauss and I¹³ have found for example, that patients with hyperacidity have a great tolerance for fats; that these patients can partake of quantities of fat in their hyperacid state with safety and comfort, amounts which they could not tolerate at all when well; that the digestive

secretions are reduced and the motility improved. Moreover, since our researches on this point were first given out, others have confirmed them, so that to-day the butter and oil cures for functional anomalies of the stomach are widely used in Carlsbad and elsewhere.

While we look back with interest and without disrespect to the traditions, to the mysteries, and to the empiricism, that governed the use of these waters in the past, we feel grateful that the time has now come when we may utilize these agents of Nature, securely entrenched in our methods by the modern scientific advancements that have been made regarding them.

There has been considerable scepticism among physicians as to the usefulness of any agent in the alleviation of the suffering of the patient with a gastric neurosis. It is undeniable that these sufferers have been immensely benefited by the Carlsbad water. In many of these cases of neurosis, symptoms of all kinds are in various cases in the ascendancy, often blotting out the principal gastric disturbances. The hope of success with such patients lies in the selection of the diet and the water cure. Individuality, here as well as everywhere in medicine, must be considered. In thinking of these cases, one is insensibly reminded of Goethe's words: "A master shows his superiority when forced to accommodate his skill within narrow limitations."

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A PROBABLE CAUSE FOR EXTRA-UTERINE PREGNANCY.

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As a member of the St. Louis Surgical Society I must apologize for reading a paper, not in the strict sense of the word "surgical." It goes back to where we ought to go back in all surgical papers—viz., to the etiology of a surgical disease. Looking at it in this light, it is a surgical paper.

It will be necessary for me to go far back in the history of reproduction and trace it down to the human fetus, in order to prove the statement which I will make.

It has been observed by biologists that animals in their own life-history and development from the ovum, pass through stages of existence corresponding to the stages through which this particular race has passed in developing from the earliest form of life. The first germ-cell may be likened to the ameba. This divides and forms several cells forming the ovum which is a still higher development. After fertilization the ovum becomes an entity, capable of leaving its seat of origin and traveling. How it progresses we do not know. It is known to travel across the abdominal cavity to the opposite tube. It travels to the uterus through the tube. This we can ascribe to the peristaltic motion of the tube. It is said to have passed across the uterus into a blind tube on the other side. We know that it absorbs nourishment during its travels. Whether by absorption, or by a process of digestion done by its external membrane, is not known. We do know of low animal organisms which live in this way and it is reasonable to suppose that the ovum does it also. When the ovum gets to a certain stage in its development, it sticks to whatever part it may be in contact with, and sends out processes, the villi of the chorion. It apparently needs more nourishment than it can obtain by absorption, so it sends out these processes. These villi penetrate the tissues and it makes no difference what tissues they are. They seem to have a power to dissolve whatever is in contact with them. They penetrate and grow in the veins. It appears as if solid tissue could not exist in contact with the villi; hence, they are surrounded by free blood-spaces. These free blood-spaces are in the Fallopian tubes, in the ovary or intestine as well as in the uterus, so they are not dependent on any special maternal tissues. Between the mother and these spaces is a thick tissue forming the placenta. This is also formed on any structure on which the ovum fixes itself. This re-

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minds me of the wall of tissue formed around any foreign body which lies in the living tissues—bullets, tubercle, septic matter. This is nature's method of protecting the body against an enemy. The nature of the placenta has been an enigma to histologists, for it presents no structure like other organs.

Now I look on the placenta as this bulwark against the attack of the fetus. The blood-spaces are the result of the digestive action of the villi. These villi must not only aerate the fetal blood as is generally admitted, but they must also appropriate all the nourishment that goes to form the liquor amnii and the body of the fetus. This is not so generally recognized. Whether the fetus gets its nourishment directly from the fetal blood or, as I think, more likely from the liquor amnii, does not now concern me. All of the nourishment must come through the villi, hence it appears as if the villi were true roots or stomachs for the fetus. I operated on a case of tubal pregnancy once, where this erosive action of the villi was beautifully demonstrated. I doubt whether the pregnancy was much over 2 weeks. The tube was very little enlarged. There was a hole as large as a slate pencil apparently punched out, through which an enormous amount of blood had come. A thin membrane protruded. During the operation, which was urgent, this was lost. It has been observed by many that when rupture of a tube takes place (not due to bleeding inside of that tube), it takes place through the placental site. If this were not a pathological condition, the tube should be strongest just here. The villi of the chorion are the cause of the rupture, by eating into the tissue. Sometimes a blood-vessel gives way inside of the tube. This, I have no doubt, is due to the penetration of a villus into an artery. It has been demonstrated that they enter veins and I believe that it will be demonstrated that they erode the arteries. As far as I know this has not been suggested; hence, this suggestion may lead to the proving of my statement.

If my ideas are correct, we may find in the digestive fluid of the villi a cause for the conditions existing in many cases of pregnancy—viz., nausea, albuminuria, etc. We see cases where the maternal tissues have overcome the erosive power of the villi and filled up the spaces. Where this happens the maternal tissues gradually get the better of the fight and the fetus is cast off, as a miscarriage or abortion. Perhaps this may take place to a certain extent in a normal birth at term. The only way to determine this would be to examine placenta of normal cases at different periods near to the usual time of birth, and, secondly, the condition of the blood-spaces. There are many inherent difficulties in such a research which will occur to all of you.

The great variation, in the time of gestation, would tend to bear out my theory. We know that a fetus of $6\frac{1}{2}$ months or 200 days can live. We also know that gestation may go on for 316 days. What a difference in time!

I have never seen anything written on the gestation period of various races, but would not be surprised if there might not be decided differences.

especially between the European races and the lowest, as the Hottentot or the Bushman.

Who can say what is the normal period? We have only an average to go by. If we would find that the Hottentots do not carry their children as long as the Europeans, it would tend to prove my theory. It is well known that the heads of the intelligent races are larger than the savage; hence, they are probably retained longer in utero.

This does not necessarily mean they are less physically matured than the white race, for the maturation of savage and, especially, tropical races, is acknowledged to be much earlier than that of Europeans. If this is true it would mean that the European fetus retains its hold on the mother longer—viz., that its parasitism is more pronounced. Now let us go back and see what we can learn from the non-human animal kingdom.

The first reproduction that we know of is by fission, as in the ameba; afterwards by splitting of the nuclei. Later comes the formation of ova, which are cast off from the mother and fertilized after being cast off. All the fishes propagate in this way. The destruction of these eggs when left to themselves is very great. Many fishes lay as many as a million eggs. Of these probably not more than 4 or 5 reach maturity. If they were not destroyed there would not be room in the ocean for them. This method has not preserved all races of fishes, for we find many extinct species. We see them becoming extinct during out life-time, from man's onslaught. So this method of preserving the species is not altogether successful. The only improvement the fishes have undergone in regard to preserving their eggs is either to have a slight maternal instinct developed, which makes them remain in the neighborhood of their nests and so frighten small fish away, or they carry their eggs around with them as the lobster does. This is the condition of the fishes to-day.

Let us look at the air-breathing animals. The earliest land animals were egg-layers as one would expect, as they were developed from aquatic animals. They were of the saurian or crocodile type, but varied from a Brontosaurus, weighing many tons, to the rather small flying Pleiseosauri or flying lizzards. All these, even the largest, the bones of which we find in the tertiary deposits of Wyoming, laid eggs. One can very easily understand the danger these eggs would be exposed to when left alone, from small animals and changes of temperature.

We cannot well imagine an animal 70 feet long and weighing many tons playing mother to a nest of eggs. The present representative of this type, the crocodile or alligator, simply frequents the neighborhood of the eggs.

Most of these animals are extinct, and we can easily understand why. It was necessary to keep these eggs longer with the mother, even until they hatched. We may put this in another way.

Those beasts born from eggs which were retained the longest, probably were less exposed to destruction, as there was a shorter time of incubation, even if brought forth as eggs. If this same process went on, those retained until hatched would have the best chance to live. It is curious that

we still have this transitional process. We have snakes which lay eggs, and there are said to be some which bring forth their young alive. I see no reason to doubt this.

We are all accustomed to think that all mammals bring forth their young alive. This is a mistake. The oldest mammals on earth are found in Australia. These are representatives of the early tertiary times and still exist.

We find remains of these all over the rest of the world. They have not been able to hold their own with the higher developed animals—the placental animals; hence they have become extinct.

It is supposed that Australia was cut off from the northern land-masses of the earth in tertiary times and has never been reunited. The higher development of animals took place in what is now our temperate and sub-arctic region of the northern hemispheres, and they gradually spread southward, driving or destroying the earlier types. The change of climate probably was an important factor, cold storage eggs not being good for hatching.

Now in Australia we have the egg-laying mammals—Ornithorhynchus and Echidna. The Ornithorhynchus or Platypus is an animal like a musk-rat, but with a bill like a duck. The Echidna somewhat resembles a hedgehog. Then we have the pouched animals or Marsupials. The Ornithorhynchus and Echidna have pouches in which they carry the eggs until hatched and the young afterwards. The pouch exudes a fluid which helps to nourish the young—the pouch being a kind of uterus.

The Marsupials, or those animals provided with a pouch which produce their young alive, are a further development of the parasitic property of the egg. The young is born alive but very immature.

All the Australian animals (indigenous) are of the pouched variety and none has a placenta. This would account for the necessity of carrying them in an incubator, which the pouch really is.

Another interesting point showing that these animals are a type between reptiles and mammals is that in their internal structure they show resemblance to the Saurians, and their bodily temperature is lower and less constant than that of placental animals. I may mention, as representatives of these animals, the kangaroo and opossum as the best known. These animals are of various sizes and shapes from the Thylacine or Tasmanian wolf and cat to the tree-kangaroo, which resembles a flying squirrel. All these animals have never reached the stage where a placenta was formed, consequently, their young are born immature and must be carried with them. The young of the largest kangaroo are not more than half the size of a fullgrown common mouse. They are termed larvæ on account of their extreme immaturity. One of these Australian animals, the bandicoot, is said to have what has been termed a vestige of a placenta. The authority in the Encyclopedia Americana believed that it pointed to a former placental condition. In my opinion it must be the beginning of a placental formation rather than a vestige. We do not find nature retrograding, which this would indicate if it was a vestige.

Fossil remains tell us that they cannot compete with the more mature placental animals.

Just what occurred in the late tertiary and early quaternary, in the northern hemispheres, we see now occurring in Australia. Those ancient animals are giving way to the placental—the dog, the rabbit, sheep, cattle, etc., and man.

Now if we consider what takes place in birds, I think that we will see something that confirms my theory that there is an antagonism between fetus and mother.

We find birds laying eggs like the reptiles, yet with this difference: the eggs are protected by a calcareous covering thrown out by the maternal structures. Now we are all accustomed to look on this as a protection to the egg. Does the egg need such a protection? Apparently not, for the eggs of tortoises, lizzards and most reptiles, are not provided with a hard shell. If this shell were a fetal structure we might be justified in believing that it was provided as a protection to the fetus. It is not a fetal structure but is exuded from the maternal structures, probably as a protection to the mother.

If we could deprive the bird of the material for making this shell she would probably produce soft shells and, perhaps, after generations bring forth live young like the Platypus, or kangaroo.

Now I think that I have shown that there is a tendency for the fetus to remain longer and longer in its mother, and I see no reason for the increasing parasitism to cease, except when the mothers have all reached the stage when all children shall be extra-uterine.

This must come slowly toward the last, for the mothers and the fetus are both destroyed; hence, cannot transmit this peculiarly acquired character. Some may say that this is contrary to nature. The forces of nature are conservative and would never make it a rule to destroy the mother in giving birth to the fetus.

This is not true. Many fishes and insects die after laying eggs and the male dies after fertilizing the female. The brown-tailed moth which is causing untold damage to our eastern forests is an example of the end-result of this parasitism. The eggs are not exuded from the body, and the young hatch in the body of the mother and live on this body, leaving the outer surface as a cocoon. Here the mother's whole body is appropriated by the young.

Now, gentlemen, I will close this long and possibly wearisome paper by stating, that the reason that investigations have not been able to account for all cases of extra-uterine pregnancy by disease or obstruction of the tube—they are often not present—is due to the fact that the cause was in this parasitic property of the ovum.

If I am right the lower races should not be so subject to ectopic pregnancy. I am sorry I can offer no suggestion as a preventive. I would not say that it is impossible, for a way may be found by the modern method of strengthening the resisting power of the body to this erosive digestive fluid of the villi, by encouraging a plastic fibrinous exudate, as it is claimed to be already accomplished by the ingestion of calcium salts.

THE STANDARDIZATION OF DISINFECTANTS.

By R. B. H. GRADWOHL, M. D., St. Louis, Mo.

Disinfecting solutions have now come to be acknowledged factors in hospital and household hygiene. The advances of preventive medicine have shown conclusively the utility of scrubbing floors, furniture and walls with chemical substances that will kill pathogenic bacteria. While this is accepted to-day as a self-evident fact, it is surprising how laymen and medical men alike unhesitatingly accept the bald, bare statement of manufacturers that this or that chemical solution is an efficient bactericidal agent. Owing to this wholesale credulity of the community at large, the market has been overflowed with chemical solutions of various composition, each stoutly advertised as a sure "germ-killer," yet absolutely ineffectual on bacteriological testing.

Many of these solutions are put out without any pretence whatever of their having been shown to be really germicidal agents by any bona fide bacteriological tests. Some of them come loudly heralded, accompanied by a report from some responsible bacteriologist who has shown by a series of tests just what they can do when brought in contact with the various bacteria used in testing disinfectants. When one comes to check up the results of the consulting bacteriologist who has made such a test with another series of tests, one is confronted with the difficulty of reproducing the same set of laboratory conditions which were at hand in the case of the first test, so that it is manifestly impossible always to obtain the same identical effects on bacteria, even though both the original and the "checking" bacteriologist were honest and competent in their work. Therefore a marked discrepancy in results occurs.

In consequence of this divergence of opinion one may either use a disinfectant that has an exaggerated value from a bactericidal standpoint, or vice versa. In order to overcome these inherent difficulties, Dr. S. Rideal and Mr. Ainslie Walker of England, proposed, some few years ago, a plan whereby all disinfectants could be put upon the same basis by a method of standardization. The method briefly expressed, was especially devised to compare the disinfecting action of different substances, using a known solution of carbolic acid as a comparison. They were intent upon obtaining a figure which they term "the carbolic acid co-efficient;" and which is of special value for comparative purposes. This figure may be obtained in the following manner: the particular strength of the disinfectant which will kill in a given time is divided by the strength of the carbolic acid, which, under the same conditions, will kill the same micro-organism in the same time. Thus, if a 1 to 80 solution of disinfectant X will kill the bacillus typhosus in 5 minutes, and the strength of the carbolic

acid which will act similarly is 1 to 100, the carbolic acid co-efficient of X is $80/100=0.8$; if a solution Y of disinfectant strength 1 to 150 is similarly equal to carbolic acid 1 to 100, the carbolic acid co-efficient would be $150/100=1.5$.

The details of carrying out the test—a modification of the old “drop” method—are as follows: a special test-tube rack is made use of. It consists of a lower tier with five holes for five test-tubes and an upper tier with two rows (one behind the other) of 15 holes each, and divided by spacing into 3 groups of 5 or 10, reckoning both rows. Into the bottom row, test-tubes containing 5 c.c. each of various strengths of the disinfectant and of carbolic acid, for comparison, are placed, and into each is dropped, at intervals of half a minute, 5 drops of a broth culture of the organism chosen for the test, *i. e.*, the bacillus typhosus, *B. coli communis*, etc.

Having finished the addition of the culture to the tubes, subcultures are made in nutrient broth, the broth tubes having previously been placed in the rack in the upper tier of holes, loopful being taken from each tube containing the disinfectant and sown into a broth tube at intervals of half a minute. In this way a subculture is made from each tube at intervals of $2\frac{1}{2}$, 5, $7\frac{1}{2}$, 10, $12\frac{1}{2}$ and 15 minutes. The inoculated tubes are the incubated; if growth occurs, it is assumed that the organism has not been killed; if no growth occurs, it is assumed that it has been killed, and the results may be charted on appropriate forms. Sterile test-tubes are employed for the disinfecting solutions, the dilutions of the disinfectant are made with sterile tap-water with sterilized pipettes, and in this way contamination with extraneous micro-organisms is practically excluded.

It should be stated that the carbolic acid which is used is carefully put in solution, using 5 grams of the crystals and adding 95 grams of sterile distilled water to make up a 5 per cent. solution, after which higher dilutions may be made, corrected always by bromine titration.

The broth should be made up in the standard way, adjusting its reaction so as to make it 1.5 per cent. acid with phenolphthalein as an indicator.

If every bacteriologist makes his broth in this way, if he prepares his carbolic acid solutions carefully and methodically and performs the technique according to this method, then there should be little if any variation in the results obtained with the same disinfectant under examination in widely separated laboratories. This method is now used and insisted upon in England and throughout Europe as an official standard, bearing the endorsement of the Admiralty, War Office, and Local Government Boards of Great Britain. Local, State and Government Boards in the United States should adopt it and require all manufacturers of disinfectant solutions to label their products clearly to show the carbolic acid co-efficient. If manufacturers are honest in their claims, they should be willing and eager to have official bacteriological checking of their

products with the Rideal-Walker technique. Physicians and laymen should likewise insist upon manufacturers showing the carbolic acid coefficient of their respective products when they desire patronage. In this way the honest manufacturer may make his dishonest competitor come out into the light and be exposed. Only those who are making false claims will oppose this procedure. It is fair to the maker, to the consumer, and to the bacteriologists.

DYSMENORRHEA OF UTERINE ORIGIN.*

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Of the many and varied topics in the domain of medicine and surgery, none has been written on and talked about more frequently, and with resulting disparaging views than the subject of the paper this evening. A subject as old as Hippocrates, or, indeed, I imagine, since woman was first taken from the rib of man. And yet when called on for this evening's paper, I felt that it was a subject on which much light might be thrown, and gladly consented to present this effort. Not that I have anything special or novel in itself, but with the hope that it might result in a logical determination of the condition known as dysmenorrhea.

I confess that with so much literature on the subject and with an undetermined and oftentimes undeterminable pathology—due to lack of opportunity for physical examination of the parts—that I approach the subject full of shortcomings.

The subject has been divided into two grand divisions: (a) dysmenorrhea from uterine cause; and (b) dysmenorrhea from extra-uterine cause.

It is my privilege to lay before you some of the uterine and intra-uterine causes and symptoms of dysmenorrhea. But before proceeding directly to the subject, I may be pardoned if I stop to call attention briefly to the conditions that exist at a normal menstruation.

Menstruation is a function which physiologist and gynecologist hesitate about defining. It is, even at this advanced period, a function about which much remains that is unknown. The best definition of a normal menstruation which I have been able to find is that given by Gould. He says: "Menstruation is a periodic discharge of a sanguineous fluid from the uterus and Fallopian tubes occurring during the period of a woman's sexual activity from puberty to menopause."

The flow is alkaline and composed of blood, shreds of mucous membrane and vaginal and uterine secretions; it is darker than ordinary blood and should not clot; its odor is characteristic and disagreeable. The quantity is from four to six ounces.

Jewett defines menstruation as "the exofoliation and renewal of the mucous membrane of the uterus."

*Read before the Long Island Medical Society.

The local condition is always one of congestion. Sometimes an intense congestion almost bordering on inflammation.

As regards the menstrual ganglion, the innervation, cause and origin of menstruation, it would require more time than is allotted to this paper, to speak even briefly of them.

All women, even while enjoying good health, experience some pelvic discomfort or inconvenience associated with a general malaise, slight pains in back and loins and some irritability of temper, at the time of menstruation.

Some women, however, menstruate without inconvenience or discomfort other than the presence of the discharge. It is impossible to suppose that the various changes, especially the congestion, which occurs during the process of normal menstruation, should take place without giving rise to a certain amount of local and general discomfort.

What is the physiological condition? When does it cease to be physiological and become pathological?

We must, therefore, draw a line between the cases of mere discomfort, and those cases of really painful menstruation, and as the sensitiveness of women varies so much it is extremely difficult to lay down any hard and fast rules. However, it may be concluded that whatever seriously interferes with one's occupation, health, or indeed even with their pleasure demands our attention.

The situation of the pain in dysmenorrhœa of uterine origin is usually in the neighborhood of the pubes. It is generally of a bearing down character and paroxysmal, and may be of a very severe type. The writer has seen two cases in which the dysmenorrhœa had finally become so painful that anæsthetics and hypodermic injection were used before the patient would consent to have anything done in the way of operative procedure.

The pain in uterine dysmenorrhœa may last one, two or three days; sometimes four or five days. There is no definite relation between the amount of the flow and the degree of dysmenorrhœa. Perhaps, on the whole, uterine dysmenorrhœa is more marked when the flow is scanty than when it is profuse. Uterine dysmenorrhœa is more common in the unmarried, but the discomfort is greatly increased after marriage.

The patient just begins to recover from the effect of one menstruation when the premenstrual pain comes on again, and while dysmenorrhœa never leads directly to death, it does interfere largely with health and happiness.

With such a state of things one has frequently to deal in practice, perhaps more frequently than with any other disorder of menstruation.

The causes of uterine dysmenorrhœa may be classed under three heads:

- I. Defective development.
- II. Inflammatory.
- III. Membranous.

Under defective development may be mentioned these cases in which the uterus failed to take on changes of secondary development; changes that the uterus should take on at the time of puberty. It may present an infantile uterus. Such a uterus is frequently found in young chlorotic girls and is usually associated with a marked form of dysmenorrhœa. An undeveloped organ performs its function badly and the uterus is no exception to the rule.

Another malformation is flexions, principally anteflexion, frequently accompanied by a stenosis. This is probably the most common of all causes of uterine dysmenorrhœa. Stenosis frequently gives rise to obstructive dysmenorrhœa, but uncomplicated cases of obstructive dysmenorrhœa are very rare. Obstruction may have been a cause at the beginning of menstrual life, but ere long a secondary congestion and even actual inflammation changes are inevitable results. There have been many objections to the term obstructive dysmenorrhœa.

It has been urged that if blood can flow through a capillary tube no os or cervical canal, however narrowly contracted, can offer a positive obstruction; and it is further pointed out that many women with most marked flexions and a pin hole os menstruate with no abnormal discomfort. Fritsch explains the pain as due to irritation from congestion. Abnormal vascular tension, the result of interference with the circulation in the vessels at the point of flexion irritates the nerves of the uterus and so causes pain.

However, the paroxysmal and alternating character of the pains and of the discharges almost compel one to consider the obstruction as of vital importance in the production of the pain.

In cases due to flexion the pain is most marked before the flow appears, disappearing sometimes as soon as the flow comes on.

In the second class of cases—inflammatory—are placed all changes that take place in normally developed uterus. Spasmodic dysmenorrhœa comes in this class as it is the result of a spasm occurring in an organ subacutely inflamed.

Whether the inflammation is due to the retention of clots in a displaced uterus, or the result of an alteration in the circulation of the uterus is a matter which scarcely admits of definite settlement.

Another very frequent cause in this class is endometritis, and also, but less frequently seen, metritis. These causes may be purely local due to sepsis, catarrhal condition or any cause that may lead to inflammation of the uterus or its lining membrane, or may be due to constitutional disorders.

The third class of the causes of uterine dysmenorrhœa embrace one single condition, that known as membranous dysmenorrhœa. This curious affection was formerly supposed to be inflammatory and was supposed to be similar to the fibrinous deposit on any mucous membrane. But for many years it has been known that we have to deal not with an inflammatory exudation, but with an exfoliation of the mucous

membrane of the uterus. As this condition is most common in married women, and as this membrane is passed not every month, but every second or third period, many writers are inclined to the theory of abortion. More so as the membrane resembles in every respect—morphologically—the early decidua of pregnancy. Microscopically, the membrane possesses the complex structure of a hypertrophic endometrium and contains follicles, nucleated cells and blood vessels. This membrane may be in one single cast of the uterus or as is more commonly the condition it may be discharged in pieces.

The pain resembles that of a miscarriage and may be very severe before the membrane is passed. This condition is frequently associated with displacement or other uterine disease, but these alone do not account for its existence.

The conditions that exist in the different subjects of dysmenorrhea are almost innumerable as the patients afflicted with it, and while it has been my object to endeavor to classify the various causes under general headings it must be remembered that the simple uncomplicated cases of dysmenorrhea due to a single cause alone is the exception rather than the rule.

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MEDICAL AND SURGICAL PROGRESS.

APPENDIX DYSPEPSIA.

A REVIEW OF RECENT LITERATURE.

By JESSE S. MYER, M. D.

1. APPENDICULAR GASTRALGIA, OR THE APPENDIX AS A CAUSE OF GASTRIC SYMPTOMS.—H. J. Patterson (*Lancet*, March 12, 1910, page 708).
2. APPENDIX DYSPEPSIA.—B. G. A. Moynihan (*British Med. Journal*, January 29, 1910, page 241).
3. THE DYSPEPTIC TYPE OF CHRONIC APPENDICITIS WITH DIFFERENTIAL DIAGNOSIS.—C. Graham and D. Guthrie (*Journal of the American Medical Association*, March 19, 1910, page 960).
4. CLINICAL SIGNIFICANCE OF GASTRIC HYPERSECRETION AND ITS CONNECTION WITH LATENT DISEASES OF THE APPENDIX.—S. Fenwick (*Lancet*, March 12, 1910, page 706).

Within the past few months a number of papers have appeared dealing with so-called "Appendix Dyspepsia." All are agreed that there exist lesions of the appendix which manifest themselves almost entirely in stomach symptoms, but are not agreed as to the name to apply to the condition. Some have gone too far in their consideration and have discussed frank cases of appendicitis in which all local symptoms are present. This is not new and the interest centers in that type of case in which the stomach symptoms are so in excess of the symptoms of the right lower quadrant that only after a long observation can a diagnosis of an appendix lesion be made.

Considering the short time that this lesion has been recognized as a primary factor in stomach troubles, there is a surprising unanimity of opinion on the part of all as to the symptom-complex presented. The clinical picture suggests most strongly a gastric ulcer, and it is this error in diagnosis which has been most often made. Gastro-enterostomy for the so-called medical ulcers is an example of this unfortunate error, with an even more unfortunate result from the method of treatment. This is heartily discouraged by all surgeons to-day, and with a pylorospasm present the necessity of examining the appendix is emphasized. How the appendix exerts its influence upon the stomach is still a question. Cannon's explanation is the most generally accepted, but the toxic theory has its adherents.

Patterson has observed 24 cases in which the appendix was the whole and sole source of the trouble. His attention was first directed to the appendix by operating for gastric ulcers which did not exist. The symptoms which he has noted have been epigastric pain, severe discomfort after food, and sour eructations. The epigastric pain radiates downward and this is regarded by him as very characteristic of the appendix. In 5 cases, hemorrhage has been noted on one or more occasions, and in

one case the vomiting of 50 ounces of blood. In 16 cases the history extended over a period of 6 years or more. Tenderness over the appendix was noted in only one-third of the cases. Paterson thinks that the symptoms are probably due to intestinal stasis. This increases the gastric secretion in the early stages and thus causes the pylorospasm. The stomach analyses gave a marked hyperchlorhydria in 2 cases, while 9 cases showed the findings of a chronic gastritis. In 5 cases he was able to obtain from 30 to 40 cc. of gastric secretion 10 hours after a lavage following a half-pint of milk. In 15 cases the diagnosis of ulcer was made and the appendix recognized as the offending organ only after a negative stomach exploration, while in the last 8 cases a correct diagnosis was made in 7. The results of appendectomy were good. Seventeen cases were cured and 3 were improved.

Moynihan has made similar observations in a number of cases. He, too, has been impressed by the marked similarity of symptoms in gastric ulcer and in the appendix lesion. He gives the history of a number of cases where a diagnosis of ulcer seemed justified and only after exploration was the true condition recognized. Moynihan lays special emphasis on the pylorospasm, and whenever it is observed he urges an appendix exploration. The mimicry of gastric ulcer symptoms in these cases is, according to him, due to an exaggerated action of the pylorus. He insists on further observation to determine the frequency with which mucous erosions of the stomach are dependent on primary lesions of the appendix. In one case the stomach was opened on account of hemorrhage and a general weeping of blood from the mucous membrane observed, but no ulcers existed. This patient was completely relieved by appendectomy. The symptom-complex which he has observed agrees in almost every detail with those noted by Paterson.

Graham and Guthrie of the Mayo clinic have reviewed some 200 cases and have compared the histories with those of ulcers and gall-bladder lesions, in an attempt to develop, if possible, a definite group of symptoms. From 115 cases operated over 1 year ago, results have been entirely satisfactory. They were possibly the first to observe that gastro-enterostomy did not cure cases of medical ulcers, but that these cases were cured of their chronic dyspepsia, if after an acute attack of appendicitis the appendix was removed. It was also observed that these cases not infrequently had acute attacks of appendicitis, indicating that the chronic lesions existed at the time of the first operations.

They have observed a neurotic element in a large percentage of their cases of chronic appendicitis. The pain in these cases is generally the prevailing symptom. It is not so prolonged as in ulcer or gall-stones. The location of the pain may be very misleading, as epigastric pain is not infrequently present. A tender spot, however, is generally found at McBurney's point, through a careful physical examination. Food does not give relief as in ulcer. The history will show in almost all cases attacks of severe abdominal pain with diarrhea in childhood. Vomiting has generally been present at some time.

Fenwick has studied the relation between latent diseases of the appendix and gastric hypersecretion. Hypersecretion is always due to an organic lesion, and in 12 per cent. of the cases the appendix is the offender. When hypersecretion is present, regardless of its cause, it always excites severe inflammation of the stomach and this may be followed by ulcers of the stomach or duodenum. These ulcerations are usually superficial and cannot always be demonstrated even when the stomach mucosa is inspected. This would account for the hemorrhage in the appendix lesions, and also for the prominence of gastric symptoms.

SCARLET FEVER.

A REVIEW OF RECENT LITERATURE.

By ALFRED FRIEDLANDER, M. D.

1. Galois.—(*La Path. Inf.*, March 15, 1909).
2. Comby.—(*Arch. de Méd. des Enf.*, August, 1909).
3. Lesage.—(*Gazette des Hopitaux*, October 16, 1909).
4. Preisich.—(*Wiener Klin. Wochenschr.*, No. 17, 1909).
5. Schamberg.—(*Arch. of Pediat.*, December, 1909).
6. Pater.—(*Arch. de Méd. des Enf.*, p. 577, 1909).
7. Woody.—(*Arch. of Pediat.*, December, 1909).
8. Weissenberg.—(*Archiv. f. Kinderheilk.*, vol. 52).
9. Gouget.—(*Soc. Méd. des Hopitaux*, February 5, 1909).
10. Brudzinski.—(*Arch. de Med. des Enf.*, January, 1910).
11. Dumas.—(*Thèse de Paris*, 1909).
12. Hutinel.—(*Bull. Méd.*, March 17, 1909).
13. Fedinski.—(*Jahrbuch f. Kinderheilk.*, January-February, 1910).
14. Monti.—(*Allg. Wien. Med. Ztg.*, March 16-23, 1909).
15. Wladimiroff.—(*Archiv. f. Kinderheilk.*, vol. 52).

Galois considers scarlet to be a form of angina (due to some type of streptococcus), with frequent, but not necessary eruptions of the skin and mucous membranes. Thus scarlet may cause only an angina in those exposed, and this angina may again cause classic scarlet in others. The affected mouth and nasopharynx are the sources of infection, and for this reason local treatment and disinfection should be vigorously employed as long as these parts are affected. Late developing nephritis is to be regarded as a toxemia from the nose and throat, which are often not properly examined and frequently neglected. Quarantine and diet should end when nose and throat are normal, whatever the condition of the skin be at this time.

Comby also names the throat, nose, and ears as habitants of the contagium, and points out the necessity of cleansing those articles which come near the patient. He believes that the attention given to cleansing the room, etc., unnecessary, unless the excretions strike the walls.

Lesage also questions the necessity for quarantine during the desquamative stage. He believes that the contagion is only from the throat, that the eruption is similar to the serum rashes, an adventitious toxemia, not a necessary part of the disease. Children may be in contact with scarlet fever in the desquamative period and not be infected, while on the other hand scarlatinal angina without eruption may communicate malignant scarlet. Stickler has inoculated 10 children with the mucus from the throat of a patient in the eruptive stage. All of them took the disease. Similar results have not been obtained, according to the author, by inoculation of the scales. The diagnosis should be based on the cycle of throat and tongue, and isolation be maintained till these become normal.

With reference to special etiology, Preisich holds that there are 2 forms

—simple and mixed infection. The latter group is characterized by adenopathies, suppurations, etc. In the simple form there are no streptococci to be found in the blood; in the latter—always. The organism of the scarlet fever patient is an excellent culture medium for the streptococcus, which is *not* to be regarded as the definite etiological factor. It is the vulnerability of the scarlet fever patient which renders the effects of the streptococci so marked.

Diagnosis. Schamberg emphasizes the fact that the diagnosis is at times a matter of extreme difficulty. A distinct angina, accompanied by a generalized scarlatinoid rash, is sufficient to justify the diagnosis. In treating patients with sore throats, therefore, drugs liable to produce rashes should not be given, unless the nature of the angina be absolutely clear.

Scarlatinoid rashes may occur in many of the exanthemata, notably in measles, rubella, and smallpox. They are also frequent in sepsis, and malaria. Serum rashes may cause much confusion. Cutaneous burns are often followed by rashes closely simulating scarlet. So far as the strawberry tongue is concerned, very wide variations in enlargements of the papulae are noted. Rarely, the strawberry tongue is found in conditions other than scarlet.

The drugs which most commonly produce scarlatinal rashes are, quinin, the salicylates, antipyrin, mercury, belladonna, veronal, opium, and the various antitoxic sera.

Pater in an effort to aid diagnosis made a series of blood-counts. He found that in scarlet there is a polynuclear leucocytosis of high degree in children of all ages. The large mononuclears and the lymphocytes are relatively diminished. The eosinophiles are somewhat increased. In scarlatiniform erythema (not true scarlet) there is either a normal or a mononuclear blood picture.

Course and Complications. Woody defines a relapse in scarlet as a return of the characteristic symptoms at any time between the 10th day of onset and convalescence. It is essentially a secondary infection by the primary agent still in the system, made possible because the immunity conferred by the initial attack has been incomplete. Two or three relapses may occur during one attack, and the relapse may be more severe than the original infection. Relapses are more common in scarlet fever wards, and the advantage of isolation is thus apparent. [Such isolation by glass partitions is carried out in some of the Paris scarlet fever hospitals.—Ed.]. Multiple attacks certainly do occur, but are surely rare. There are, however, authenticated cases of 2, 3 and even 4 attacks in the same individual at long periods of time. Woody believes that regularly recurring attacks are probably cases of erythema scarlatiniforme.

Weissenberg reports seven cases where the second attack was more severe than the first. There are individuals in whom one attack does not only *not* confer immunity, but even causes heightened susceptibility. This is important where children who have had scarlet (as in institutions) are brought into contact with new cases. The necessity for strict isolation of children who have had scarlet is thus apparent.

Measles, as a complication of scarlet, is of serious import. Gouget, in one of the Paris hospitals, treated 676 cases of scarlet during part of 1908. Among these, 39 had measles, all of whom recovered without bronchopneumonia, a very exceptional record. In 410 cases of associated measles and scarlet, collected by this author, there was a mortality of 32 per cent. He attributes his good results in the 39 cases recorded to the strict isolation and individual care received by these patients.

Brudzinski, per contra, cannot find that the occurrence of measles during scarlet, should be regarded as being of particularly grave moment. He does not find that the association necessarily causes a very decided increase in the mortality rate.

Summing up 535 cases of scarlet, treated at the Hospital for Sick Children in Paris in 1908, Dumas reports a mortality of 4.1 per cent. The most frequent complications were severe anginas, adenopathies, and otitis. Albumin was found in only 15 cases. Only 3 cases showed a typical nephritis; 2 cases of empyema and 9 of bronchopneumonia were found. There was associated measles in 19 cases, chickenpox in 7 cases, pertussis in 3 cases. There were 4 cases with prolapse.

Discussing the question of sudden death in scarlet, which as is well known may occur at any stage, Hutinel says that autopsies in some of these cases have shown changes in the suprarenals. It is possible that the marked prostration, cardiac insufficiency, arterial hypotension, syncope, and skin pigmentation may be due to adrenal lesion. The author describes a case where symptoms of collapse were relieved by the use of adrenalin and the patient recovered.

Treatment. As the result of a critical study of 317 cases treated with Moser's serum (a polyvalent streptococcic serum), Fedinski is convinced of its very decided value.

Monti reports results obtained by the use of Morpinami's scarlatina toxin, "Scarlatin." It is obtained by extraction from blood of animals, by a method in which the albumin is changed. It appears to be harmless. There are no serum rashes. It is an antitoxin to be given internally. It is of decided prophylactic value. If infection has occurred, it is valuable only so long as there are no streptococcic complications. It is useless in septic cases. It is put up in two strengths. For details as to its use, the original article must be consulted.

Wladimiroff reports the results obtained by the use of Gabritschewsky's serum (prepared in the Moscow Bacteriological Laboratory). Over 50,000 vaccinations have been made in Russia without any bad results. The vaccinscarlet in some cases was so like the natural form that the differential diagnosis without the history would have been difficult. With the vaccine, however, the disease runs its entire course in 3 to 4 days. The exanthem is all out in 12 hours. The strawberry tongue appears on the second day. There is no desquamation. It is intended to use the vaccine, just as the smallpox vaccine is used, prophylactically.

CARCINOMA OF STOMACH. X-RAY DIAGNOSIS.

A REVIEW OF RECENT LITERATURE.

By EDWARD HOLMAN SKINNER, M. D., Kansas City, Mo.

1. BEITRAEGE ZUR TOPOGRAPHIE DES MAGENDARMKANALES BEIM LEBENDEN MENSCHEN NEBST UNTERSUCHUNGEN UEBER DEN ZEITLICHEN ABLAUF DER VERDAUUNG.—Prof. H. Rieder, Fortschritte a. d. Gebiet d. Röntgenstrahlen. Bd. VIII., S. 141. Röntgenuntersuchung des Magens und Darmes. *Münch. med. Woch.*, 1906, No. 3.
2. MITTEILUNGEN A. D. LABORATORIUM FUER RADIOLOGISCHE DIAGNOSTIK.—Dr. Guido Holzkecht. Band I., Helt I., 1906.
3. DIE RADIOLOGISCHE DIAGNOSTIK D. INTRA- UND EXTRAVENTRIKULAREN TUMOREN ZUR FRUEHDIAGNOSE DES MAGENCARCINOMS.—Dr. G. Holzkecht and Dr. S. Jonas. 1908.
4. ON THE PRESENT POSITION OF ROENTGEN DIAGNOSIS IN DISEASES OF THE STOMACH AND INTESTINES.—Prof. Jolasse. *Archives of Roentgen Ray*, March, 1908.
5. ATLAS UND GRUNDRISS DER RÖNTGENDIAGNOSTIK IN DER INNEREN MEDIZIN.—Franz M. Groedel. 1909.
6. THE ROENTGEN RAYS AS AN AID IN THE DIAGNOSIS OF CARCINOMA OF THE STOMACH.—George E. Pfahler, M. D. *Transactions of the American Roentgen Ray Society* for 1908.
7. ROENTGEN RAY DIAGNOSIS IN PULMONARY TUBERCULOSIS AND GASTRIC CARCINOMA AND ULCER.—Edward H. Skinner, M. D. *The Medical Herald*, May, 1909.
8. DIE RÖNTGEN TECHNIK, DRITTE AUFLAGE.—Prof. Albers-Schoenberg, 1910.
9. TYPICAL ROENTGENOGRAPH OF THE PYLORIC CARCINOMA.—Dr. M. Bécère. *Bulletin de la Société de Radiologie Médicale de Paris*. May, 1909.
10. CARCINOMA OF THE STOMACH.—Sidney Lang, M. D. *Journal Am. Med. Association*, Vol. LIV., No. 11, March 12, 1910.
11. UEBER SALZSAUREPROBE OHNE MAGENSCHLAUCH.—Dr. Gottwald Schwarz. III. Röntgen Kongress, 1907.

The use of the *x*-ray in the diagnosis of pathological conditions in the chest and abdomen has not received the support in America that it has in Europe; partly from the fact that we have little literature in English upon this subject; partly because of the necessity of the fluoroscopic method of examination. The use of the fluoroscope is not popular as yet in America, but with proper means of protection to the roentgenologist and patient there need be no danger in its use.

In the diagnosis of cancer of the stomach the *x*-ray is able to offer valuable assistance at a period in the course of the disease when operative interference would afford some relief. The success of any treatment, or of any operative procedure for carcinoma of the stomach, depends upon

the early diagnosis of the condition. As an aid to the clinical examination and the chemical analysis of the stomach contents, the *x*-ray furnishes the third support of the tripod upon which an early diagnosis may rest.

The technique of the roentgen examination involves the use of an opaque medium which can be followed in its course through the alimentary tract. The apparatus necessary for the examination consists of a freely movable light-tight box, lined with material opaque to the *x*-ray, in which the *x*-ray tube is placed. The box should be fitted with a diaphragm, the size of which may be varied at will. The fluorescent screen should be hung so that it will also be freely moveable. The patient is preferably examined in the standing ventro-dorsal position, *i. e.*, with the fluorescent screen against the abdomen of the patient and the patient's back apposed to the box containing the *x*-ray tube. The first step in the examination is the observation of small bismuth capsules which the patient is directed to swallow. Their excursion through the esophagus and into the stomach should be noted. The second step in the examination is the observation of a small amount of bismuth subcarbonate (about 5 to 10 grams), mixed in water, and the careful observation of the action and disposition of this bismuth by the stomach. The third step in the examination is the observation of the stomach after the ingestion of a bismuth meal. This bismuth meal consists of 40 to 60 grams of bismuth carbonate mixed up with and held in suspension by a porridge of farina, potatoes, corn meal, oat meal, or meal of peas. By studying the opaque shadows of this bismuth pudding the roentgenologist is enabled to afford us knowledge of the topography and motor conditions of the stomach; the course of the bismuth meal through the stomach; the form and size of the stomach; its position, peristalsis, and emptying-rate. It will demonstrate with exactitude gastropnoia, dilatation, hour-glass contraction, stenosis of pylorus, and the presence of tumors. The presence of a carcinomatous mass or infiltration of the stomach-wall would present an abnormal filling defect in the stomach outline. Such conditions also produce changes in the normal stomach peristalsis.

The study of the peristalsis of the bismuth-filled stomach is best accomplished by the fluoroscope. One can make sketches or tracings of the changes in the stomach outline upon the lead glass covering to the fluoroscope or upon attached paper. The radiograph may be used to record a single phase of the peristalsis or the filling defect. Attempts to draw conclusions from radiographs alone will prove disappointing, for a study of the peristalsis and motility is absolutely necessary to derive exact information.

Carcinomatous tumors or infiltrations of the pylorus produce typical roentgen findings. Where the carcinomatous pathology produces pyloric stenosis they may be classified as follows: (1) a high degree of distension of the stomach, both transversely and longitudinally; (2) we have an anti-peristaltic wave; (3) we have a great disturbance of the mobility of the stomach; (4) there remains within the stomach all or a portion of the bismuth meal when the examination is repeated within 24 or 72 hours. The fluoroscopic picture of the filling defect in pyloric carcinoma is quite characteristic in that the bismuth pudding does not fill out the pyloric end of the stomach, but gives us a ragged outline where the bismuth emulsion comes in apposition to the carcinoma.

To test the acidity of the stomach, Schwarz devised some small bags of gold-beaters' skin, containing bismuth, the time taken for solution in the stomach depending upon the degree of acidity. It is simple to note the

small bag in the stomach and note by the fluorscope or radiograph, at an average interval, whether it is dissolved or not. Schwarz claims that these special capsules, if dissolved in 1 and $\frac{1}{2}$ hours, indicate hyperacidity; in 2 and $\frac{1}{2}$ hours, normal amount of HCl; in 5 hours or longer, anacidity.

It is apparent that the x -ray examination of any stomach case must be conducted by one who is familiar not only with the physiology of the normal stomach, but also with the normal x -ray findings, when the bismuth-filled stomach is viewed radioscopically or radiographically. Two types of the normal stomach, as seen by the x -ray, are described. The normal stomach, that Holzknecht describes, has the pylorus at the lowest point of the stomach shadow. The normal stomach, as described by Rieder, exhibits a certain amount of lifting power (hühhöhe) of the lower or caudal pole to the pyloric orifice, consequently the caudal pole is the lowest part of the stomach shadow. The majority of bismuth-filled stomachs that one sees upon the fluorescent screen present the Rieder form. The Holzknecht normal type is seen very infrequently. This may depend upon the fact that most of the cases referred to the Roentgen laboratory for stomach diagnosis necessarily possess a pathological stomach. If the Roentgenologist makes it his practice to examine stomach cases in the recumbent position he will probably find more stomach outlines simulating the steer-horn shaped stomach. It is generally conceded, however, that the examination of all stomach cases should be made with the patient in a standing position with variations, for this is the posture in which the individual lives the greater part of his day, and it is also the posture in which we have the stomach hanging by its two supports at the cardiac and pyloric ends.

The technique for the fluoroscopic examination of the stomach embraces many details that should be understood by the clinician who is examining his case with the roentgenologist. First, the examination should be conducted in an absolutely dark room. The examining physicians should remain within this darkened room for at least 10 minutes before the fluorscope is used in order to accommodate the eye to the darkness. The fluoroscopic image at its best requires a good accommodation of the eye. Another point in technique is that the patient should be in a fasting condition before the bismuth is introduced, because the remains of a small meal would hinder a correct estimate of the fluoroscopic image.

It is apparent that this x -ray method of stomach examination offers much that cannot be obtained by other means. The work must be done by those familiar with it, so that the results shall be of such value that this method cannot possibly fail into disrepute through overzealous workers.

OBITER DICTA FROM FOREIGN JOURNALS.

SOME RELEVANT WORDS ON TUBERCULOSIS.

Of the many publications which come to a medical editor's desk, the majority have a sameness that indicates that for some unexplained reason a dead level of monotony must be pursued to insure success. Of course, this may be a hasty conclusion drawn from a superficial survey of the situation which to-day obtains in medical circles; but be that as it may, an editor's daily task would be considerably lightened were he to detect oftener, than generally falls to his lot, indications that medical journalism is keeping pace with the lay journals of the better class, in the matter of excellent letter-press and exceptionally good illustrations. That the improvement we desire can be effected without deteriorating into a cross between a popular magazine and a medical journal of so thin a veneer of science that it is unworthy the name it boastfully bears, has recently been evidenced by the French monthly publication *L'Hygiène*, edited by Dr. Maurice de Fleury (Paris and New York: Manzi, Joyant & Cie.), which is so sumptuous in all its appointments that unstinted praise is but the proper return for its many excellences. The subjoined article by Professor Landouzy, from the initial issue which was published in December, is but one of a large number that would bear translating; but being aware that the subject of tuberculosis is at present more widely discussed than any other medical subject, we felt that an authoritative statement would not be inopportune. The excerpt, while quite lengthy, is by no means the whole article; for that, as well as for the exquisite reproductions of paintings by Jan Steen, Albert Besnard, Jakob Jordaens, Luca della Robbia, Sir Joshua Reynolds, David Teniers, François Boucher and others too numerous to mention, we refer the interested reader to the journal itself. Professor Landouzy's trenchant pen writes as follows: No one to-day has any right to be ignorant of the manner in which tuberculosis has spread throughout the world. The ravages of the great Destroyer are such that it is incumbent on all not to forget that it is our duty thoroughly to understand how very extensive these are. When this great lesson in regard to the contagiousness of tuberculosis is learned we shall arrive at that much-desired mental state, where there will no longer be any feeling of complete and dangerous indifference to its onslaughts or invincible fear of its slightest manifestations. In all countries, but especially in France, tuberculosis has been regarded in the last twenty years as the arch-enemy of mankind. Cholera, plague, and yellow fever epidemics, disastrous earthquakes, ruinous wars, all of these combined, have not killed off as many individuals, wiped out as many families, and degenerated the human species to so great an extent as has the disease which we are to-day just beginning to combat. Again, tuberculosis works woe for the cattle-breeder, on account of his decimated stables; it alarms the economists, as well it might, on account of the expense borne by the state as a result of the premature doing away of thousands of infants, adolescents, and adults, as well as the crippling of some 800,000 individuals, and also by reason of the amount of money that is expended by hospitals, sanatoriums, and

families, in attempts to alleviate suffering by operations, medicines, and constant material assistance, due to a condition of invalidism. The French economists have calculated that, whether the fiscal year is favorable or unfavorable as regards tuberculosis, more than 100,000,000 francs is spent that should revert to the treasury.

Wars, with all their horrors, have not the terrible aspect that this disease presents, and though I am not forgetful of the Crimean war with its two long sieges in the most rigorous winters, and the devastation resulting from cholera, typhoid, scurvy, and dysentery, and which cost France 100,000 men, the mortality was less than it has been every eight months in France, in recent times, as a result of tuberculosis.

To-day, cholera and the plague, as regards Europe, are almost things of the past, and even their feeble manifestations every now and then have nothing in common with the uninterrupted march of tuberculosis. True, there are memorable epidemics to count up against cholera,—the dark years of 1832, 1848-49, and 1853-54,—when France paid tribute to the extent of 350,000 persons; but though these are astounding figures they are equalled by the number of French people who died of tuberculosis in the years 1900 and 1901. When cholera was epidemic in Paris in 1884, 949 persons died of the disease, but in the same year, out of the 57,000 deaths recorded, tuberculosis claimed 10,000! In 1720 the pest at Marseilles killed 40,000 persons, a stupendous number which is difficult for us to grasp, yet at the end of the nineteenth century, in less than eleven years, the mortuary statistics showed that tuberculosis ravaged the Phœnician city of a like number of citizens. And again, if we wish to follow in the wake of truth and conceal nothing, it must be admitted that every year more than 150,000 French people die of tuberculosis—a city of the size of Toulouse completely decimated!—and at Paris 12,000, of whom nearly 2,000 are children.

Now, though these numbers are appalling enough to give us pause for many a day, they sink into insignificance in comparison with the morbidity of the disease. The popular impression is that tuberculosis is an affection that is limited to the disease known as consumption, but physicians know only too well that bronchitis, pleurisy, asthma, chlorosis, anemia, spinal curvature, sciatica, and so-called rheumatism, are undoubtedly tuberculous. In truth, there are in the world, to-day, many more people with a tuberculous taint who do not cough than there are "consumptives;" hence, the epoch in the evolution of medicine when it was thought that "phthisis pulmonalis" with coxalgia and meningitis, was the sum total of tuberculous diseases, is no longer regarded with any scientific respect. This morbidity, when added to the mortality, must surely convey to all thinking minds the frightful frequency of the tubercle bacillus.

The matter of combating the peril incident to the spread of tuberculosis, during the last years of the nineteenth century, was due to the activities of the physicians who, while not less solicitous of their tuberculous patients than formerly, took an increasing interest in society at large, and, especially, in the welfare of their respective countries. In the fight against the disease in France the science of medicine, which had hitherto been individual in character now became communal, thus affirming its right to be considered the first among the social sciences. Until this very propitious time, the disease, in its larger meaning, was regarded with indifference, for though consumptives received the best of treatment as conceived in those days, the only thought uppermost in the attending physician's mind was to alleviate individual suffering. Medi-

cine made a point of relieving the stress attending frequent expectoration, of combating fever, assuaging pains, stopping emaciation, and of buoying up the spirits of patients so that they would not sink into a state of deep depression. But the source and nature of the disease was as much an unexplained chapter as in Hippocratic times.

As far back as the time of Henry IV., André du Laurens, physician to the king, had said that "the suppurating king's evil, which so readily contaminates healthy subjects, occurs oftener when there are poverty and poor food on account of civil wars;" and, in 1645, in the town of Rheims, where the kings of France "touched the king's evil," a pious young woman founded, in the name of Saint Marcoul, a hospital for isolating this disease, and, which, moreover, by letters patent signed by Colbert, was granted the privilege of a secular institution for the treatment of the king's evil on account of its being "a communicable disease." In the eighteenth century, Ferdinand VI., of Spain, and Philip IV., of Naples, issued royal ordinances compelling, by penal law, all physicians and families to notify the authorities in case anyone had tuberculosis or had died of it, so that the house could be disinfected and all clothing and utensils used by the patient burned at once. Edicts similar to these obtained in all the countries of Southern Europe, and this fact should be emphasized since in the north of Europe no such laws had been enacted. A case, which illustrates the extreme laxity of northern European governments at that time, was best evidenced when Chateaubriand was in Rome with Madame de Beaumont, whom he had taken there on account of her tuberculous condition. Writing to Fontanes, the author of "*Mémoires d'outre-tombe*" says: "I am in great financial straits due to the fact that I have been unable to sell my carriages to anyone in Rome. As in the times of the Goths, a similar law prevails here in regard to the contagiousness of consumption; and as Madame de Beaumont used my carriages two or three times no one in Rome will run the risk of buying them." Like inconveniences were experienced by George Sand who, when sojourning with Chopin at Majorca, on account of his health, was ordered to leave at once, and after wearily travelling to Barcelona found but small welcome there; in fact, was so molested that she and the composer soon left for a more congenial place.

But despite the precautionary measures taken by Spain, Italy and Provence—measures which put all these governments on the defensive, the disease itself, as regards its true history and causes, remained unknown. And, furthermore, despite the extensive and thorough work of the French school of medicine in pathological anatomy and its study of the symptomatology and the evolutionary stages of tuberculosis, as well as the discovery of auscultation by Laënnec and his illuminating conception of the uniqueness of this disease, the science of medicine was incapable of wrestling with the great enigma, until the experimental discoveries of Jean-Antoine Villemin and the bacteriological revelations of Robert Koch. The clinical and experimental demonstrations of the virulence, transmissibility, and contagiousness of tuberculosis adduced the idea of its determinism and affirmed the principle that it was avoidable.

In 1865 Villemin inoculated rabbits and guinea-pigs, sometimes with the expectoration, at other times with the tubercle itself, or the cheesy matter removed from the body of a recently deceased patient or from the carcass of an animal, thereby producing tuberculosis. Hence, he concludes that "tuberculosis is a specific affection; it causes an inoculating agent. It belongs to the same class of virulent diseases as glanders and syphilis. The inoculation results in a tubercle but is not visible; it is in

truth a most subtle agent which is in the tubercle itself and escapes the naked eye. Hence we ought at once to make up our minds to place tuberculosis among the affections that occur on account of a morbid germ which multiplies in the body. Similar to all parasites the germs multiply, and though we supply them with the means whereby they live and reproduce themselves, we never create them, since they contain that power within themselves."

The parasitic nature of tuberculosis, its avoidance, its prophylaxis, and the possibilities of vaccination, were either mentioned in extenso or merely touched upon by Villemin, during his labors as professor at the military hospital, Val-de-Grâce. Chauveau, who was the first to demonstrate tuberculous infection by the digestive tract, in 1868, by giving tuberculous products to animals which thereupon became tuberculous, made this declaration: "It appears to be now proved that the identity of tuberculosis with the recognized virulent diseases is so absolutely uncertain that it is a matter of supreme importance for us to find out the exact character of this poison, or deny altogether that the disturbing agent is a poison."

Villemin's ideas made no sensational leap into notoriety but quietly influenced others, until the best minds in the medical profession were won over. Cohnheim emphasized the importance of the new interpretation of the professor at Val-de-Grâce, by declaring that "it would be quite difficult to find a pathologist who would have the hardihood to deny that tuberculosis is an infectious disease." Following many investigators who had hoped to find Villemin's "most subtle agent," it remained for Robert Koch, in March, 1882, to discover the bacillus which bears his name. Then as if by magic the hitherto clouded sky that hung over the subject of phthisiology was cleared of all its many darknesses!

Bacteriology demonstrated the virulence, specificity, and transmissibility of the disease,—facts which Villemin's prescience had already made clear to the medical profession. By means of Koch's bacillus medical science made a huge stride in advance, for even the most doubting Thomas in the medical ranks saw, believed, and was convinced. What Villemin had vainly tried to impress upon physicians, what his mind's eye had clearly seen, was accepted without demur. Surely Condillac spoke the truth when he said: "Nihil est in intellectu, quod prius non fuerit in sensu."

When the hygienists mete out honors to Robert Koch for the knowledge given them, whereby they are the better able to combat and even prevent tuberculosis, some thought should be given to Villemin, since his opinions have been confirmed by the later discovery. Was not the gist of all modern teachings contained in his memorable words: "The consumptive soldier is, according to my limited opinion, the same menace to the health of his companions that the glanderous horse is to the other horses in the stable"?

CORRESPONDENCE.

PARIS LETTER.

THE PROBLEM OF ANTITUBERCULOUS VACCINATION.

By AUGUSTE A. HOUSQUAINS, M. D.

The hopes which were entertained, both by physicians and the public, on account of the communications from savants such as Koch, Behring, Maragliano, to mention only the best known, have not been realized. We are still awaiting the discovery of a method of vaccination which shall effectively militate against tuberculosis. In all the bacteriological laboratories throughout the world, researchers are working with a most commendable zeal, and their activity is directed toward no other object but this discovery. Hence should our mental state be one of despair? Such is the question which was recently asked by Dr. Calmette, director of the Pasteur Institute at Lille, and when one of his worth speaks we certainly ought to hearken. Dr. Calmette cannot believe that the problem will forever remain without solution.

In truth, the Koch bacillus presents a certain number of characteristics which differentiates it from the microbes which cause the acute disease, since the infection which he describes is usually slow to develop. The lesions have a tendency to remain localized; they are nodular alterations which undergo a necrotic transformation that is no other than caseation, or a sclerosis that is not likely to invade the whole system. The danger of the tubercle bacillus appears to reside in the local toxins which adhere to the microbial cell itself. Without doubt the Koch bacillus secretes in equal proportions soluble and diffusible toxins, but by comparison these are much less active than the local toxins. Nevertheless it would be wrong to deduce from these considerations that the tubercle bacillus is the only means of neutralizing its destructive properties. A number of experimental and clinical reasons give us hope that at some future day a solution of the problem will be granted us.

All animals in which blood-temperature does not vary, and even some animals in which it varies, are susceptible of being infected by the tubercle bacillus. Human beings, cattle, swine, spontaneously tuberculizable, are infected only in an accidental fashion by the Koch bacilli or by the alimentary and pathological products derived from them. Such for example is the case with the deer when tubercularized in menageries, the birds in the poultry-yard, and the fish in aquariums. A singular fact is that the bacillus adapts itself, in a certain measure, to the characteristics of the animal species it infects; its virulence and even its morphology assume characteristics on account of being localized in a cer-

tain species of animal. For example, the bacillus of tuberculosis in birds yields cultures that are softer and contain more fat than cultures derived from the human bacillus. Again, the bacillus of avian tuberculosis is without action on the dog, although the dog is readily affected by the human bacillus; and chickens, though easily affected by the avian bacillus, are refractory to the human bacillus. One could multiply these examples. The tubercle bacillus of fish develops at a low temperature (24° C.), while it does not endure a temperature of 36° C., though this temperature is that which best suits the human bacilli. Now there is no longer any doubt that in all cases, one and the same bacillus is peculiar to the special conditions pertaining to the life of a species.

The conclusion then is that the same tubercle bacillus can infect the majority of animals, at least all animals having warm blood. Nevertheless, certain species are extremely insusceptible to the tubercle bacillus; and even among a certain species, normally susceptible, one encounters a number which offer a very great resistance to infection, though the conditions be most propitious to contamination and infection always possible. As regards subjects that have the quality of resistance, the infection is only effected under certain conditions: the degree of the virulence of the bacillus employed, the quantity of the virus, and, above all, the frequency of the infections to which the subject is submitted. It is a matter of interest to note that an old lesion confers a remarkable degree of resistance against new infections, even though they be serious. For example, in a subject having a locally benign lesion that is hidden and cannot be easily mapped out, infection which, under ordinary circumstances, would result in acute disseminated tuberculosis, manifests itself generally in the disease in its chronic form.

These facts, gleaned from experiments, awaken the idea that anti-tuberculous vaccination comes within the range of future possibilities. Numerous clinical facts corroborate this statement. Thus patients who have had pleurisy, lupus, scrofula, do not contract acute tuberculosis in case of an infection; the lesions which occur are slow in evolving. Therefore one is justified in saying that there is such a thing as autovaccination of the organism against the toxins of the Koch bacillus. Here one should remark that these poisons have no analogy with tuberculin, since all attempts at preventive or curative tuberculization have, as is known, completely failed. Continual subjection to tuberculin never produces a real immunity against tuberculosis. Similarly, all attempts which have been made to achieve immunity by bacilli from animals of various species have proven futile, though the bacilli may be more or less modified. More successful has been the attempt which has for its object the bringing about of the rapid and integral resorption of tubercle bacilli into the lymphatic ganglia. The bacillus culture obtained on pure beef bile acquires special physiological properties. Injected in small doses into the veins of cattle or rabbits it produces an acute febrile disturbance that is curable. Introduced into the stomach through the mouth it is readily absorbed by the intestine and is destroyed very slowly in the mesenteric ganglia. The serum of animals infected with this bacillus presents interesting properties.

As long as the organism is on the defensive against infection, the serum contains an abundance of anti-bodies. It hastens the formation of the cobra venom—that is to say, the serum is rendered hemolytic because it contains free lecithin, while healthy human, bovine, and porcine serums do not contain it. (The poison of the cobra is not normally hemolytic for red corpuscles which have been washed in a salt solution.) It helps considerably phagocytosis of the tubercle bacilli *in vitro*, when there

are present leucocytes freshly extracted from a young animal. All these reactions may be calculated. They disappear when the animal is cured. They also disappear when the tuberculosis passes on to an almost fatal issue.

We are also aware that the injection of tuberculin determines a general or local reaction in subjects dominated by tuberculosis. But in animals infected with bacilli cultivated on bile these general and local tubercularized reactions manifest themselves with an intensity correlative with the activity of the defense against the infection. When the resorption of the bacilli is complete or when the serious infection has triumphed over the means of defense, their production ceases. Therefore it is possible to decide in the early stages, whether the infections were recent and, in consequence, could prevent the carriers of the bacilli from producing new reinfections until the first infection had been spontaneously cured—namely, until the bacilli already existing in the organism are reabsorbed. Hence the necessity of an early diagnosis which would permit the isolation of the carriers of the bacilli, and the suppression of contaminations in families and the repeated infections by the milk from tuberculous cows.

It is highly probable that a large number of human beings immunize themselves spontaneously against tuberculosis, in varying degrees. We have proof of this in the extreme frequency of curable tuberculous infections in young children, a frequency that is attested by the immense number of those who react to tuberculin up to the age of 15.

To affirm that almost everyone is or has been tuberculous is not an exaggeration. The statistics show that 25 per cent. succumb to tuberculosis. The remaining 75 per cent. present at the time of death, when this takes place at an advanced age, tuberculous lesions which had been cured. Hence the inference is that they were tuberculous without knowing it. Their resistance against a bacillary infection which affected them, indicates that with them the infection was limited, and that no reinfection from cohabitation with the tuberculous took place; in other words, the initial lesion which they harbored remained localized in an organ or in a ganglionic group and was cured or encysted, thereby granting the individuals a resistance or an immunity sufficient to render them proof against future attacks.

What conclusions should we derive from these considerations? M. Calmette has summed up all conclusions in his antituberculosis propaganda. We cannot suppress the bacillus but we can at least reduce, as much as possible, the number of ways in which reinfection is acquired; we can war against the dissemination of expectoration, against contaminated milk; and also by calling into play the defensive forces with which our organisms are so wonderfully endowed we can do effective work against infection. These are at present our only resources but they are not ineffectual if we wish to content ourselves with what is now being done, until the time arrives when the discovery is made which is not so chimerical as one might suppose—namely, antituberculous vaccination.

April 10th.

BOOK REVIEWS.

THE INTERNATIONAL MEDICAL ANNUAL. A Year Book of Treatment and Practitioner's Index. 1910. Twenty-eighth year. New York: E. B. Treat & Co. Price \$3.50.

When the reviewer states that this year's issue of the International Medical Annual is fully the equal of its predecessors, he has given it as high praise as is in his power. It is obviously impossible to give an adequate account of the contents of a book so encyclopedic in character and extent. Although a summary of the year's progress in medicine, it is far from being a mere compilation. The various articles are written by the leading clinicians and laboratory workers of England, and several are by eminent Americans. Among the most important contributions may be mentioned a review of last year's work on cancer by Handley; on peritonitis by Deaver and Ashhurst, of Philadelphia; on vaccines by Harris; on sea-water injections by Robert-Simon, of Paris, and on surgery of the breast by Priestley Leech. The chapter on urinary deposits is illustrated by a series of beautiful colored plates, superior to those to be found in any text-book. Both the internist and the surgeon will want this book, not on their shelves but on their desk, for constant reference.

THE SEXUAL LIFE OF WOMAN IN ITS PHYSIOLOGICAL, PATHOLOGICAL AND HYGIENIC ASPECTS. By E. Heinrich Kisch, M. D., Professor of the German Medical Faculty of the University of Prague; Physician to the Hospital and Spa of Marienbad; Member of the Board of Health, etc., etc. Only authorized translation into the English language from the German, by M. Eden Paul, M. D., with 97 illustrations in the text. New York: Rebman Company, 1123 Broadway. Price \$5.00.

In this volume the sexual life of woman is considered both in relation to the female genital organs and to the feminine organism as a whole, in relation both to the physical and mental development of the individual, and in relation alike to the state of health and the processes of disease. Thus from the standpoint of clinical investigation and practical experience the book is a contribution towards the solution of the sexual problem, nowadays recognized as one of supreme importance.

The original German edition appeared several years ago and has always ranked among the most important contributions to this problem in the German language.

A PRACTICAL STUDY OF MALARIA. By William H. Deaderick, M. D. Fully illustrated. Philadelphia and London: W. B. Saunders Co., 1909. Price \$4.50.

This is one of the notable books of the year. The author, a practicing physician of Marietta, Ark., has had unusual opportunities for the study of malaria and, having a thorough scientific training, has utilized them to the full. While the literature of the subject is given adequate space, the bulk of the book is devoted to the author's own observation. The result is an interesting and instructive study of malaria as it occurs in our southern states. Much attention is given to the various circumstances that facilitate the breeding of anopheles mosquitoes, especially among the colored population, and a considerable number of interesting photographs lend point to the author's observations. Much space is devoted to a consideration of malarial hemoglobinuria, for the explanation of which the author advances a theory of his own. He discards entirely the view that it is a quinine intoxication. His explanation is somewhat as follows: In severe attacks of malaria, there is a great destruction of red blood corpuscles. This detritus is carried to the liver and there destroyed. If the liver is overburdened with the necrotic hemoglobin its cells are stimulated to an overproduction of hemolytic substances. Under favorable circumstances these can enter the circulation, combine there with complement and

produce a great hemolysis. Hemoglobinuria, while thus caused by malaria, is dependent for its occurrence upon the coincidence of certain other factors.

The proof-reading might have been more careful. A number of errata remain to be corrected in a subsequent edition. Thus Panama was certainly never called "the Frenchman's Grace."

SURGERY: ITS PRINCIPLES AND PRACTICE. Vol. V. By Various Authors. Edited by W. W. Keen, M. D. Philadelphia and London: W. B. Saunders Co.

This last volume of Keen's system maintains the same high standard as the preceding ones. The first article by Rudolph Matas is on the Surgery of the Vascular System. It is an exhaustive handling of the subject; it alone would make the volume most valuable. Particularly clearly and fully does it present the surgery of the pericardium and heart, and is an agreeable contrast to the chapters on this subject usually encountered, including as it does all the findings and suggestions made in this field in the last few years. The surgery of the arteries, the most recent of new surgery, is completely dealt with. That part dealing with aneurysm, with the treatment of which Matas's name is almost as closely identified as that of John Hunter, receives a big share of attention.

Several authors have taken a hand in the chapter on female genito-urinary organs and the method of examination and diagnosis. Surgical technique is treated in a very practical way by John H. Gibbon; Ligation of Arteries in Continuity and Amputations has the stereotyped consideration at the hands of Bickham. The chapter on Operation on Bones and Joints is by Warbasse; Plastic Surgery, by Roberts; Accidents, by Estes; Parathyroids, by Charles H. Mayo, and the Surgery of Intracranial Operations of the Fifth and Eighth Nerves, by Frazier. There are several valuable chapters dealing with the medico-legal side of surgery, and quite a good chapter on Hospital Organization, by Ochsner.

THE ELEMENTS OF THE SCIENCE OF NUTRITION. By Graham Lusk, Ph. D., M. A., F. R. S. (Edin.), Professor of Physiology at Cornell Medical School, New York. Second edition, revised. Octavo of 402 pages, illustrated. Philadelphia and London: W. B. Saunders Company. 1910. Cloth, \$3.00 net.

Since the first edition of Prof. Lusk's book on nutrition in 1906, a considerable amount of new material has been added to our knowledge in this field. This necessitated a nearly complete rewriting of the book. It differs from the other books on dietetics in laying stress rather upon the experimental substructure of the science than upon its clinical utilization. Any internist who desires to know not only what to do but why, in the matter of dietetics, certain things should be done, will want this book on his shelves for frequent reference.

A TEXT-BOOK ON THE PRACTICE OF GYNECOLOGY. For Practitioners and Students.

By W. Easterly Ashton, M. D., LL.D., Professor of Gynecology in the Medico-Chirurgical College of Philadelphia. Fourth edition, thoroughly revised. Octavo of 1099 pages, with 1058 original line drawings. Philadelphia and London: W. B. Saunders Company. 1909. Cloth, \$6.50; half morocco, \$8.00.

The regularity with which new editions of Ashton's "Gynecology" appear must undoubtedly be regarded as the most convincing proof of the popularity that this volume is enjoying both among students and teachers of gynecology.

LEUCOPATHIES, METASTASES, ALBUMINURIES ET ICTERES LEUCOPATHIQUES, par le Dr. Emile Feuillie, Ancien interne des hôpitaux de Paris. Un vol. in-3 raisin de 196 pages avec 4 planches en couleurs. Paris: G. Steinheil, éditeur, 2, rue Casimir-Delavigne. 1906. Prix 6 francs.

For a considerable number of years, the author together with a number of collaborators, among whom we may mention Prof. Achard, has been investigating the more intimate nature of a variety of intoxications. As the result of a vast deal of work, both experimental and clinical, he has come to some conclusions at once astonishing and seductive, and, which, if confirmed by others, will revolutionize many of the existing notions about a variety of diseases. The book is so compact of novel and suggestive ideas that no detailed account of them can be given here. We hope to discuss it at length in another department in a subsequent issue. It may serve to whet our readers' curiosity to say that the writer offers good evidence in favor of his contention that, among other conditions, albuminuria, hemoglobinuria, hematogenic icterus, edema, inflammatory induration, due to a pathological fragility of the white blood corpuscles.

OTITIC CEREBELLAR ABSCESS. By Heinrich Neumann, Privat-Dozent, University of Vienna. Translated by Richard Lake, F. R. C. S. London: H. K. Lewis, 136 Gower St. 1909. Price 4s.

The non-German reading profession is to be congratulated that this classical monograph of Dr. Neumann's has at last been translated into English. The book is excellently compiled and thought out, and the translation is worthy of praise. The opening chapter deals with the reported cases of cerebellar abscess since 1900 and gives conclusions based on these statistics. Then follows a chapter dealing with etiology and pathological anatomy. Under symptomatology the author discusses in succession the focal symptoms, general symptoms, and remote effects. A real contribution to the diagnosis of cerebellar abscess is contained in the practical application of Dr. Neumann's exhaustive work on nystagmus of otitic and cerebellar origin. The stages of cerebellar abscess are well divided into the initial, the manifest, and the terminal, each of which is discussed in the author's usual clear and lucid manner. Chapters on diagnosis, differential diagnosis, prognosis, operation, and after-treatment, follow; while the concluding chapter gives a detailed account of the cases published since 1900, including the cases of the Politzer clinic and those operated upon by Dr. Neumann himself. Dr. Neumann, although comparatively young in years is old in experience, and by his exhaustive efforts has gained for himself a most enviable reputation among the leading otologists of the world. His work should be in the hands of every practicing otologist. It is to be exceedingly regretted that the scientific contributions from Dr. Neumann's pen are at present comparatively limited; nevertheless, it is to be sincerely hoped that in the near future he will produce a more comprehensive book dealing with the whole subject of otology.

BOOK REVIEWS

THE PRACTICE OF GYNECOLOGY. For Practitioners and Students. By W. Easterly Ashton, M. D., LL.D., Professor of Gynecology in the Medico-Chirurgical College of Philadelphia. Fourth edition, thoroughly revised. Octavo of 1099 pages, with 1058 original line drawings. Philadelphia and London: W. B. Saunders Company. 1909. Cloth, \$6.50; half morocco, \$8.00.

TRANSACTIONS OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION. For the year 1909. Volume XXV. "The object of this Association shall be the study of Climatology and Hydrology and of Diseases of the Respiratory Organs."—Constitution. Philadelphia: Printed for the Association. 1909.

THE SURGERY AND PATHOLOGY OF THE THYROID AND PARATHYROID GLANDS. By Albert J. Ochsner, A. M., M. D., LL.D., Professor of Surgery in the Medical Department of the University of Illinois, Chief Surgeon to Augustana Hospital and St. Mary's Hospital, Chicago; and Ralph L. Thompson, A. M., M. D., Professor of Pathology in the St. Louis University School of Medicine, St. Louis. With 57 illustrations in the text and 40 full-page plates, 4 of the plates being in colors. St. Louis: C. V. Mosby Company. 1910.

THE SPIRIT OF YOUTH AND THE CITY STREETS. By Jane Addams, Hull House, Chicago. Author of *Democracy and Social Ethics*, *Newer Ideals of Peace*, etc. New York: The Macmillan Company. 1910. Price \$1.25.

THE PROPAGANDA FOR REFORM IN PROPRIETARY MEDICINES. Sixth edition, containing the various exposures of nostrums and quackery which have appeared in *The Journal of the American Medical Association*. Price, paper, 10 cents; cloth, 35 cents. Pp. 292, illustrated.

THE RAT AND ITS RELATION TO THE PUBLIC HEALTH. By various authors. Prepared by direction of the Surgeon-General. Washington: Government Printing Office. 1910.

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TWENTY-THIRD ANNUAL REPORT OF THE STATE BOARD OF HEALTH OF THE STATE OF OHIO FOR THE YEAR ENDING DECEMBER 31, 1908. Springfield, Ohio: The Springfield Publishing Company, State Printers. 1909.

THE SEXUAL LIFE OF WOMAN IN ITS PHYSIOLOGICAL, PATHOLOGICAL AND HYGIENIC ASPECTS. By E. Heinrich Kisch, M. D., Professor of the German Medical Faculty of the University of Prague; Physician to the Hospital and Spa of Marienbad; Member of the Board of Health, etc., etc. Only authorized translation into the English language from the German. By M. Eden Paul, M. D. With 97 illustrations in the text. New York: Rebman Company, 1123 Broadway. Price \$5.00.

THE PRACTICAL CARE AND FEEDING OF CHILDREN. By Mary A. Duns, Graduate of the Woman's Hospital, Chicago, Ills. Second edition, revised and enlarged. Chicago: Chicago Medical Book Co. 1909. Price \$1.50.

DISEASES OF THE GENITO-URINARY ORGANS AND THE KIDNEY. By Robert H. Greene, M. D., Professor of Genito-Urinary Surgery at the Fordham University, New York; and Harlow Brooks, M. D., Assistant Professor of Clinical Medicine, University and Bellevue Hospital Medical School. Octavo of 605 pages, profusely illustrated. Philadelphia and London: W. B. Saunders Company. 1908. Cloth, \$5.00; half morocco, \$6.50.

A TEXT-BOOK OF THE PRACTICE OF MEDICINE. By James M. Anders, M. D., Ph. D., LL.D., Professor of the Theory and Practice of Medicine and of Clinical Medicine, Medico-Chirurgical College, Philadelphia. Ninth revised edition. Octavo of 1326 pages, fully illustrated. Philadelphia and London: W. N. Saunders Company. 1909. Cloth, \$5.50; half morocco, \$7.00.

MEDICAL GYNECOLOGY. By S. Wyllis Bandler, M. D., Adjunct Professor of Diseases of Women, New York Post-Graduate Medical School and Hospital. Second revised edition. Octavo of 702 pages, with 150 original illustrations. Philadelphia and London: W. B. Saunders Company. 1909. Cloth, \$5.00; half morocco, \$6.50.

THE DISEASES OF THE NOSE, MOUTH, PHARYNX AND LARYNX. A Text-book for Students and Practitioners of Medicine. By Alfred Bruck (Berlin). Edited and translated by F. W. Forbes Ross, M. D., Edin., F. R. C. S., England; late Civil Surgeon His Britannic Majesty's Guards Hospital, London; Assistant North London Hospital for Consumption and Diseases of the Chest; Clinical Assistant Metropolitan Hospital for Diseases of the Nose and Throat, etc. Assisted by Friedrich Gans, M. D. Illustrated by 217 figures and diagrams in the text, many of which are in colors. New York: Rebman Company, 1123 Broadway. Price \$5.00.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles on Treatment, Medicine, Surgery, Neurology, Pediatrics, Obstetrics, Gynecology, Orthopedics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene, and Other Topics of Interest to Students and Practitioners. By leading members of the Medical Profession throughout the world. Edited by Henry W. Cattell, A. M., M. D., Philadelphia, U. S. A. Volume 1. Twentieth series. 1910. Philadelphia and London: J. B. Lippincott Company. 1910.

THE DEVELOPMENT OF THE BONES IN EARLY LIFE. Studies by the Roentgen Method for the Determination of an Anatomic Index. By Thomas Morgan Rotch, M. D., Professor of Pediatrics, Harvard University. From the Transactions of the Association of American Physicians. 1909.

NERVOUS STATES; THEIR NATURE AND CAUSES. By Paul Dubois, M. D., Professor of Neuropathology at the University of Berne; Author of "The Psychic Treatment of Nervous Disorders," "The Influence of the Mind on the Body," "Self-Control and How to Secure It," etc. Authorized translation, by Edward G. Richards. New York: Funk & Wagnalls Company. 1910. Price 75 cents.

KLINISCHE DIAGNOSTIK UND PROPÄDEUTIK INNERER KRANKHEITEN. Von Dr. Adolf Schmidt, Professor in Halle a. d. S. und Dr. H. Luethje, Professor in Kiel. Mit 211 Abbildungen im Text und 3 Tafeln. Leipzig: Verlag von F. C. W. Vogel. 1910. Preis: 14 Mk.

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EDITORIAL.

THE RENAISSANCE OF ST. LOUIS MEDICINE.

The advent to St. Louis of the American Medical Association should confer a twofold benefit. First, it must tend here, as wherever it occurs, to benefit the local profession by increasing the sense of solidarity, by affording opportunities for instruction, by knitting the bonds of professional amity between the local physicians and their colleagues from all over the United States, and by educating the public to a proper appreciation of the importance of the public service rendered by the medical profession, not merely to the individual, but to the community at large. Secondly, it will tend to demonstrate to the medical world of the United States that a certain reproach, perhaps not altogether unjust even though exaggerated, which has obscured in the past the fair fame of St. Louis medicine, and which, like the proverbial bad name that may hang a dog, still clings to it in distant quarters, has no longer sufficient foundation to justify its continued existence.

St. Louis, many decades ago, was the centre of a vast pioneer area, and pioneer exigencies demand untrammelled and unconventional expedients to meet them. And these, imperfect though they were, were splendidly forthcoming. But with the gradual emergence of that area from the stage of pioneering to that of accomplished and progressive civilization, expedients and methods that were once not only admissible, but in the highest degree praiseworthy, became first a hindrance and then a reproach. It was the persistence of these pioneer methods, which had outlived their usefulness and appropriateness and now hindered where they had formerly aided the evolution of local medicine, that gave rise to the aforesaid reproach. From being in the forefront of the times, St. Louis medicine had fallen to the rear; and with the continuance of out-

lived expedients, the evils inseparable therefrom naturally persisted as a parasite—no longer an unavoidable misfortune to be condoned, but a moral blemish to be condemned.

The three principal evils of this kind centered about medical education, the production of medical nostrums, and medical journalism. The first physicians who settled in this pioneer community had necessarily been educated in foreign countries or in one of the medical schools already established in the older settled parts of this country on the Atlantic seaboard. These naturally would be the adventurous spirits. But as the community grew, they would be insufficient to meet its needs and it would become necessary, as indeed it was highly desirable, to train new physicians from among the youth of the community itself. Only a few of these, however, from the nature of the case, would be able to afford the time and expense of a journey far from home and of several years of study abroad. So, with commendable patriotism these pioneer physicians banded themselves together and, obtaining charters from the State, started at their own expense schools wherein they trained up physicians from among the youth of the community in the best way circumstances allowed.

Thus arose the proprietary medical college—a splendid expedient to meet unsettled conditions. But, as Dr. Flick says in his article on "The Medical Profession in Relation to Preventive Medicine," in this issue of the *INTERSTATE* (p. 373), when speaking of the majority of medical colleges in the United States: "Inasmuch as our colleges have not been endowed and have had to spring from the initiative of medical men, they have had to be conducted to some extent as commercial enterprises, and commercialism has of necessity played a part in them. Teachers have had to be practitioners of medicine as well, and through the weakness of human nature professorships have become better leverages for getting practice than for advancing scientific medicine." In this respect, however, St. Louis stood at that time only where other cities of the United States also stood; if it graduated students on a two years' course of four or five months each, so also did the College of Physicians and Surgeons of New York, the University of Pennsylvania, and even the Harvard Medical School. In the early sixties, St. Louis had at least two colleges that were advanced in the matter of requirements. The Humboldt Medical College exacted a preliminary educational standard, a graded course, and a four years' curriculum; while, from the faculty of the Medical School of the St. Louis University, which was closed in 1855, had come into existence the St. Louis Medical College. Notwithstanding that it thus became a proprietary college, it carried with it many of the university ideals and lengthened its curriculum first to three, and subsequently to four, years in spite of a

serious consequent falling off in attendance, with a corresponding deficiency of financial resources.

The commercial element, however, it must be confessed, predominated for some time after the medical profession generally was awaking to the need of a higher grade of medical education, and to this persistence is largely due the reproach of which we have spoken. This commercial tendency was doubtless augmented by the fact that the St. Louis Medical College was quite a close corporation; and many young men of pronounced ability and reasonable ambition, finding that their years of arduous labor in teaching gained them no overt recognition, seceded from it at various times to found new medical colleges, in which they hoped to attain the dignity that they felt that their work had earned.

The renaissance of St. Louis medicine may be said to date from the fusion, in 1899, of the Missouri Medical College with the St. Louis Medical College which in 1891 had become affiliated with Washington University. The combined colleges then became the Washington University Medical Department. The Beaumont Hospital Medical College and the Marion-Sims College of Medicine, two other proprietary schools founded respectively in 1886 and 1890, also united in 1901 to become the Medical Department of the St. Louis University, which had been without a medical school since 1855. This university promptly showed its progressiveness by looking around for promising men of mark who should devote their whole time to the teaching of the fundamental branches and to research work, and professors of anatomy, physiological chemistry, pharmacology, physiology and pathology were brought from Harvard, Chicago University, and the University of Missouri.

These facts, perhaps, would have availed to dispel much of the adverse feeling, but in the interim a great increase had taken place in the proprietary medicine trade in St. Louis, being stimulated by the phenomenal commercial success in certain instances. Certain medical journals succumbed to the temptation of prostituting their reading columns by the publication of articles which, although ostensibly original communications by presumably reputable physicians, were in reality written around some proprietary preparation. Then other journals arose, which owed their establishment primarily to the interests of the proprietary drug trade, and possessed in fact no other *raison d'être*. Thus it happened that a tripod of professional delinquencies at one time existed to bring St. Louis medicine into evil repute—a low grade of medical education offered by numerous proprietary schools on frankly commercial lines, a large proprietary medicine interest, and a number of medical journals of indifferent value that reflected no credit on the medical community from which they sprang.

But now let us look at the present condition of things. No less than 10 of the proprietary medical schools that once existed here are now defunct, while 4 more have united in pairs, to become medical departments of two reputable universities, and offer to-day a full course with graded instruction, good laboratory facilities, and increasing preliminary requirements. The Washington University Medical Department, especially, is to be congratulated, in that during the past few months it has been endowed, through the munificence of a few St. Louis citizens, with a capital of several million dollars, which is intended to release it entirely from the struggle for existence, that it may concentrate all its energies on the struggle for excellence. A large tract of land has been secured on which will be erected a general hospital, a children's hospital, laboratory and clinical buildings with dispensary facilities, fully equipped for teaching purposes, the whole having the same relations to the medical school as exist in the case of Johns Hopkins. The medical staffs of the hospitals are to be selected by the university. The ablest teaching that St. Louis can afford will be reinforced by calling the strongest available men from all parts of the country to fill the leading chairs. Among those already engaged are Dr. George Dock, of Michigan and Tulane Universities, for the chair of medicine; Dr. John Howland, of University and Bellevue, New York, for pediatrics; Dr. Eugene L. Opie, from the Rockefeller Institute, for pathology; and Dr. Joseph Erlanger, of the University of Wisconsin, for physiology. Suitable appointments are now under consideration for the chairs of surgery, medical chemistry, preventive medicine, and pharmacology. A strong staff of permanent assistants to these chairs will also be appointed, to assist in teaching and to care for the dispensary and hospital service. Moreover, from this year on the preliminary requirements will demand, in addition to the usual four year high school course, one year of college work. From the fall of 1912 this will be increased to two years of college work. When, in addition to all this, we realize that by the new scheme of hospital organization, recently passed by the city, a vast field of clinical material is now thrown open for teaching purposes, under a staff of visiting physicians appointed independently of any school affiliations, it must surely be evident that St. Louis will afford opportunities for medical education, both graduate and post-graduate, hardly to be excelled.

To sum up: Close corporation methods no longer obtain in St. Louis, but instead professors in the fundamental branches are brought from wherever they can best be obtained, to devote their entire time to teaching and scientific research. The disreputable proprietary preparations that in past years impaired the reputation of this city, never received more than scant support from the local practitioners of that time; and to-day

there is a decided intolerance of such unscientific preparations on the part of a more highly educated and better-minded profession. Many of the less reputable medical journals also have disappeared, and the journals that remain, for the most part aim at an increasingly high standard, both professionally and ethically. Add to this an efficient health department, a municipal commission for the study of tuberculosis well in the forefront of the campaign, a good medical library, a medical history club whose work has already placed it well up in the front rank, and last, but by no means least, a reorganized medical society, rapidly becoming representative of all that is best in medicine, as regards numbers, professional requirements, and ethical standards, and it must surely be ungrudgingly admitted that the present era constitutes a true renaissance of St. Louis Medicine.

THE FOURTH MEETING OF THE AMERICAN MEDICAL ASSOCIATION AT ST. LOUIS.

From the 7th to the 10th of this month, the American Medical Association will be in session in St. Louis for the fourth time since its inception in the Hall of the Medical Department of New York University on May 5, 1846, but for the first time since its reorganization.

The first visit of the Association took place on May 2, 1854, when it was only eight years old. At this session 269 members were in attendance. The scientific contributions were few in number, two of them being by St. Louis physicians, viz., a communication by Dr. M. L. Linton, who essayed to prove the essential identity of yellow fever with bilious and other forms of miasmatic fever, all of which he considered due to a "hydrocarbonaceous state of the blood;" and one by Dr. R. S. Holmes, on Erysipelas. We find that at that meeting, too, the same problems that have so grievously vexed the soul of the medical body politic of recent years, agitated the profession then. The "immediate organization of state and county medical societies," where such did not already exist, was urged by Dr. Atlee, of Pennsylvania. The Report of the Committee on Education urged "the importance of establishing a uniform standard of preliminary education, of extending the term of lectures, and especially of greatly elevating the standard of professional attainments requisite to graduation." It further urged post-graduate attendance of practitioners at the medical schools; that schools below standard should make up their deficiencies; and that "some uniform system of examining candidates for admission into the ranks of the medical profession, *in addition to the*

collegiate examinations for degrees," [italics in the text] "should be adopted in all states of the Union." The proprietary medicine question also came under discussion, and then, as now, the "Relations Between Medicine and Religion" engaged attention, in a paper by Dr. James L. Phelps, of New York. The importance of the milk problem, especially among the children of large cities, was the subject of remarks by Dr. N. S. Davis.

The second visit took place on May 6, 1873, after an interval of 19 years. The attendance on this occasion numbered 452. At this meeting, medical education and organization were again to the fore. Other burning topics of to-day that received notice in the presidential address of Dr. Logan were a national sanitary bureau, sexual instruction, and the scientific expert question. It is especially worthy of note at this juncture, when Senator Owen's bill for the creation of a national department of health is before the legislature and will doubtless receive at this meeting the hearty endorsement of the American Medical Association, that at this second St. Louis meeting, in 1873, the president approved the "recent introduction in Congress of a bill for the establishment of a National Bureau of Sanitary Science," with the result that a committee resolved that "the establishment of a National Sanitary Bureau, with relations to the General Government similar to those of the Bureaus of Agriculture and Education" [*i. e.*, nonsubordinated] "is highly desirable as a means of promoting sanitary science and the protection of the public health."

On May 4, 1886, the Association met in St. Louis for the third time, with an attendance of about 1100. Again the proprietary medicine question and the improvement of regulation of medical practice were to the fore. In yet another respect we learn that human nature is ever the same, and that wherever there is a government of any kind there will be those who are constitutionally disaffected; for we read in the address of the president, Dr. Brodie, as follows: "It has been charged that this Association has failed to meet the requirements of its founders, and instead of being a body for the advancement of scientific medicine, has degenerated into a body of 'thankless intriguers and demagogues.'"

Thus we see markedly exemplified in the history of the St. Louis sessions the solidarity of the medical profession. Always it is of one mind as to the need of adequate education for the physician; of adequate laws to protect the public against the incompetent physician; of organization of the profession, not only to protect itself against unjust encroachment on its rights, corporate and individual, but to place it in a stronger position for using, for the public good, that knowledge of which, by virtue of continuous and collated study, it has become the depository. And finally, always it has felt the impropriety of physicians associating themselves

with anything that savors of charlatanry. Of the rectitude of these principles there has never been, can never be, any doubt. Any differences that may have arisen have had reference, not to them, but to the best means of carrying them out.

And what of the session of 1910? That it will be most successful there can be no reason to doubt. Apart from the excellence of the scientific program as published in the *Association Journal*, among the reasons for this belief may be mentioned the location of St. Louis as the centre of the middle west, into which all important routes converge, making it easily accessible; the fact that the main support of the Association has hitherto always come from the middle west; and finally the excellent work of the local Committee of Arrangements.

Among the features that should be especially mentioned is the scientific exhibition. This promises to be of unusual excellence this year. To this St. Louis will contribute exhibits through its two universities, its hospitals, its health department, and its social economic associations dealing respectively with tuberculosis, pure food, and public recreation. A particularly interesting exhibit, we feel sure, will be that of the St. Louis Medical History Club, for several of its members are possessed of valuable historical collections of great interest. There will also be some interesting personal exhibits by physicians.

MEDICAL RESEARCH WORK.

Probably every one who has done research work has noted with interest that there are two distinct types of mental activity focused on every problem: first, the immediate, narrow, and intense concentration on the nucleus of the problem in hand; and, secondly, the more diffuse mental embrace of all facts and theories that touch the problem in even the most remote fashion. As a result of this duality, the recompense from investigative work is in essence also two-fold. The concentration of activity furnishes a new positive or negative fact, and with it the joy of discovery; the more diffuse consideration of allied subjects furnishes a widened breadth of view, and with it, the exhilaration attending mental expansion.

The recent literature on surgical shock illustrates most clearly this point of view. Practically every investigator of shock has concentrated his energy on one very limited phase of the problem; for example, Crile on vaso-motor function, Boise on heart action, Meltzer on inhibition, Keen and Mitchell on reflex paralysis, Henderson on the carbon dioxide content of the blood, Schur and Weisel on the chromaffin system, and Buerger on the sympathetic abdominal ganglia. Each one of these investiga-

tors has set himself, as his specific task, the determination of the relationship between shock and the particular function considered by him as a causal factor. The solution of this very definite problem calls for the type of mental exercise that we have characterized as *intensive*, and as eventuating in the pleasurable satisfaction of discovery.

It is self evident, however, that the very enunciation of the new fact carries with it the necessity both of surveying previous theories and of practising critique on the views of preceding investigators. This is the *extensive* part of the work, the effort furnishing the stimulus of mental expansion. A very brief consideration will serve to illustrate how many and how varied are the interests aroused during this phase of the investigation. Historically considered, the problem leads back to the earliest times, when the ancients, unable to explain the relationships existing between trauma, death, and no visible pathological lesions, called to their aid the *deus ignotus*; then, advancing forward, the path leads to a consideration of the era of the introduction of railroad building and traffic, with the consequently large number of shock-producing accidents. Following closely on this era, comes that of the Crimean and American civil wars, in the medical reports of which struggles much space is devoted to shock. This purely clinical era was followed by a decade of experimentation, crude indeed, but illuminated by the names of some of the greatest masters of medicine—Bernard, Leyden, Mitchell, Keen, and others—who prepared the way for the last period of more accurate and careful laboratory work.

The historical résumé serves the purpose of emphasizing the necessity of investigating the various theories passed in review, and thus there results a careful analysis of fundamental physiological problems, such as fatigue, cardiac activity and control, vasomotor and cerebral function, reflex activities, inhibition, augmentation, and countless other physiologic processes. It is impossible to review these physiological functions without running counter to fundamental problems of pathology; and so we are forced to make another excursion. But even before the journey has gone this far, it has probably become evident that certain important general biological principles have intruded themselves for examination and critique. We are, for example, forced to note the stages of evolutionary development of the higher and lower nerve centers, and the consequent differences between the so-called fundamental and accessory body functions. With this side line disposed of, there still remains for the particularly curious and interested individual a consideration of such philosophic dogmas as vitalism, teleology, and pure materialism.

Finally the problem is finished. The verbal or printed report may furnish, perhaps, only the bare statement of a new positive fact, the announcement of a qualifying negative phenomenon or the confirmation of earlier theories. But the ultimate value of the work is not thus limited, but is specifically two fold; for, in the first place, the sum total of knowledge has been increased by the discovery, and in the second, the correlation of allied branches of science has been reviewed and confirmed.

OPINION AND CRITICISM.

INTERNATIONALISM IN MEDICAL EDUCATION.

Not so very long ago, when the American medical student wanted the best education he was compelled to go to Europe for the finishing touches. Then the establishment of schools in this country, modeled after the ideals and on the experience of the German University, gave some men the opportunity of procuring an excellent "made in America" education, and fewer found a trip across the ocean necessary. The influence of Louis, of Pasteur, of Virchow was spread here by their former students, now professors to the younger generation, and while the hero worship of foreigners was still strong it was often placed by proxy at the feet of American teachers. In the early days the faults of our system and the general lack of scientific aim did not produce any great amount of admiration for our medicine on the part of our European colleagues, and even when the work of some of our laboratories and clinics was as excellent as any produced abroad, it rarely reached general scientific circulation. At this late day there still exists a tendency to disregard most of our work, and it is not altogether unusual for an American scientist to find one of his discoveries re-discovered by some continental confrère. Naturally this state of blissful ignorance is deplorable, and any means of producing a more wholesome situation should be welcomed. We should invite attention to our system as it is, we should urge careful inspection of our low and our high lights. This ought not be done by rush tours through spectacular clinics or magnificent laboratories or institutes, but by as careful attention as the American student gives to European medicine.

The several "tours" which have made such interesting reading matter in recent foreign journals give a fair appreciation of American medicine, —at least as fair as the average American tourist gets of Europe during his first Baedeker-guided trip of wonders. The temporary exchange of chairs by professors would be an excellent method, as it has already proved itself to be in other academic lines, but probably the best evidence of the universality of medicine would be in including our universities in the peripatetic schedule of the foreign teacher. The privat-docent at Kiel can look to his professorship at Breslau, Berlin, or Vienna; we should like to see him look as well to Boston, Baltimore or Chicago. Already England has taken the Scotch Cushny and the Canadian Osler from their American chairs. Our most recent move in this game of universal

checkers was when we took Von Pirquet from Vienna, and no one questioned the wisdom of our selection. Not only would pediatrics in this country have been advanced by the work and inspiration of Von Pirquet, but through his association with American medicine there would have been an excellent opportunity for the furtherance of a closer community of interest between the old and the new world of medical thought. Consequently we cannot avoid a selfish regret at the report that he will soon leave this country to take up the duties of professor of pediatrics at Breslau.

VACCINE THERAPY.

Most American, and many other, physicians are not in complete agreement with Sir A. E. Wright in the statement that the physician of the future will be the immunisator, but most will agree that he has stimulated a healthy and beneficial interest in a valuable phase of medical practice. While much has already been accomplished, especially in the subacute and chronic infections, there still remain enough obscure problems in opsonic treatment and vaccines to cause considerable scientific skepticism as to the general application of the principles laid down by Wright. The use of vaccines in the acute fevers has not proved of sufficient value to make any conclusions justifiable, possibly because the underlying immunity conditions are not well enough understood.

Vaccines have been used both for cure, and as the word originally signified, for prophylaxis. Their prophylactic value in cholera and plague is well known, and the results obtained by the Japanese army from protective vaccination for bacillary dysentery are reported to be excellent. The English army used a vaccine against typhoid fever during the Boer war, the results of which were good, but beyond these reports no great study has been made in acute diseases in men. Camp life has always been the joy of the typhoid bacillus, hence Russell's account of the use of the injections of dead typhoid bacilli as a preventive of typhoid fever in the United States army deserves attention. The results seem to indicate two main points of importance, namely that the injections are harmless at all times, even when the patient has been exposed to the disease and should show the theoretic negative phase; and, secondly, that there was less typhoid among the injected men than among those not so treated. Certainly his results justify as thorough a test of this method as is possible; for the importance of prophylaxis against typhoid fever during war need not be further emphasized than by reference to past experiences which proved to our regret that oftentimes the bacillus was mightier than the bullet.

CANCER THERAPY.

Charlatans, quacks, and cancer cures have been associated so long that cancer cures must emanate from a known scientific source before the medical profession takes notice of their announcement. Pathetic tragedies underlie many items concerning such cures published by the daily papers. It is another story when men like Hodenpyl, of New York, and Gilman and Coca, of Manila, publish in scientific magazines results of careful research. Despite the tremendous amount of work already done, little of fundamental importance has yet been established, consequently little in the way of therapeutics can be expected; however, one need not be too pessimistic, since the cure of syphilis and malaria long preceded the knowledge of the spirochæta and the plasmodium. Hodenpyl reports in a most conservative manner the results of subcutaneous injection of the chylous ascitic fluid removed from a patient cured of cancer. The patients on whom the fluid was tried all had inoperable tumors, but in most cases apparent cure resulted. Whether the curative agent lies in some unknown antibody generated by the tissues of the cured patient, or whether an obscure biochemical reaction explains the results, cannot as yet be said; but studies are now being made on the mechanism of the cure.

No less important, and perhaps closely related, are the observations made by Coca and Gilman. These investigators, reasoning from the results of animal experiments, remove the tumor from the patient, make an emulsion, and re-inject near the site of the original tumor. The effects are apparently identical with those reported by Hodenpyl—inflammatory reaction and sloughing of the remaining tumor.

None of the investigators is claiming wonders; results so far have been good, but the patients are too few, and the time since the beginning of the treatment too short to permit of broad deductions.

[Since these remarks were written, we learn with deep regret of the death, on May 5th, of Dr. Eugene Hodenpyl. His untimely and premature decease at the early age of 47 is deeply to be deplored as a loss to scientific medicine. He was an investigator who preferred solid and carefully appraised results to public éclat, and who displayed a wholesome and conservative reticence where some are tempted to seek premature display.]

THE DUCTLESS GLANDS.

In the "New London Dispensatory" for 1677, the following drugs are listed:

Human heart in powder for epilepsy.

Human skull and human brain for a variety of disorders, chiefly debility.

With the physiologically tested preparations of the modern laboratory the imagery of such medication makes a profound contrast. This is particularly true in the case of the ductless glands. The progress of the past decade, during which time one gland after another has yielded its secret to the industry of the experimental biologists, is noteworthy. We can no longer agree with Magendie, who, in 1841, remarked: "I have nothing to say of the suprarenal capsules; what function has the thyroid gland?—nobody knows it!" Thyroid activity has been the subject of the most exhaustive study during this period. Kocher's designation of the complex of symptoms following complete removal of the gland as *cachexia strumipriva* found its analogue the same year in Semon's suggestion that the symptoms of myxedema were similar, and due to loss of thyroid secretion. The theory of Moebius, that the Basedow syndrome is an expression of hyperthyroidism, is now universally accepted, while the brilliant results of administering thyroid in cretinism are parts of the romance of medicine.

At first the absolute anatomic and physiologic independence of the thyroid and parathyroid was not recognized. The tetany that sometimes followed the removal of the thyroid *in toto* was supposed to be due to the loss of thyroid function, until the suggestion was made that its cause lay in the simultaneous removal of the parathyroids. Then the striking subsidence of symptoms following the administration of parathyroid glands in post-operative tetany was conclusive that these glands were the causative agent. Probably the most interesting phenomenon was the demonstration by Voegtlin and MacCallum of disturbed calcium metabolism in experimental tetany following parathyroidectomy, and the cure of such tetany by the administration of calcium salts. A few clinical reports have also been made showing the same effect of calcium.

ORIGINAL ARTICLES.

THE MEDICAL PROFESSION IN RELATION TO PREVENTIVE MEDICINE.

By LAWRENCE FLICK, M. D., of Philadelphia.

From the earliest days preventive medicine has been an honorable field of work for medical men. Its importance and its state have varied at different times and in different parts of the world, but it has received recognition at all times and in all civilized places. In the early days of the human race, especially in that Eastern cradle of civilization, it apparently occupied a more important position than at any time since, and it is probable that the practice that still exists among the Chinese of paying the physician during health and not during sickness had its origin in that pristine pre-eminence.

In the nature of things preventive medicine is the quintessence of scientific medicine. Its state may therefore well be accepted as a criterion of the state of scientific medicine. That it is again coming to the foreground and claiming its logical place, is due to the great progress which has been made during recent years in all branches of scientific medicine. Its renaissance brings with it some practical questions and problems for the medical profession.

First, has the medical profession as a body and as individuals kept pace with preventive medicine and made use of it for the advancement of the profession and the benefit of its members?

Second, where lies the responsibility for the failure of the profession to make use of preventive medicine for its own well-being?

Third, how shall the profession as a body and its members as individuals adjust themselves to preventive medicine so as to avoid prejudice and ruination?

The purpose and object of preventive medicine is to keep away from mankind those ills which interfere with the pursuit of happiness by crippling physical well-being. The pursuit of happiness is an inherent right of man for the maintenance of which he has struggled from the beginning, and disease has been a stumbling block before which he has often stood helpless. It has lain across the border line of things within his control, and the physician has had mainly to content himself with trying to repair the damage that has been done, hopefully looking forward to a

time when he could prevent that damage. More exact knowledge of the cause of disease, which has been obtained through the labors and sacrifices of the physician, now enables him to prevent that damage. Is someone else to step in and reap the harvest?

The president of one of the great American universities has recently advocated the creation of the new profession of "Sanitation." Already there has come into existence a new profession of "Sociology" which lies in between what this university professor would create and that part of medicine known as the healing art. Both sanitation and sociology belong to scientific medicine, being the practical application of certain kinds of medical knowledge to the needs of mankind. Sanitation is the application of preventive medicine to the material side of man's life, such as cleanliness, housing, and food supply; while sociology is its application to the sentimental and intellectual side of man's life, such as social intercourse, interdependence, and education. Medical science has gradually worked out the problems of cleanliness and how it can be maintained, wherein housing has been inconsistent with human happiness and what must be done to correct it, what foods are best for health and happiness and how they can be kept for use. Who is to apply this knowledge? Is it to be thrown out into the world in books and magazines for the mechanic and manufacturer, the transporter and the storekeeper, to use as best they can, or is it to be accurately and definitely applied by well trained men who understand it and know its full scope? If it is to be applied by trained men are those men to be physicians or members of the new profession of sanitation?

In the same way medical science has worked out how human beings may live happily together without prejudicing one another's physical well-being, wherein they must be helpful one to another for their own sakes, and how education may be carried on and civilization advanced without crippling and injuring the units of society which constitute the physical basis of education and civilization. Our knowledge on these subjects can be best applied by men who have been well grounded in the practice of scientific medicine and who understand the entire subject, well trained physicians. Are they to apply it, or is it to be applied by others under the title of sociologists?

Sociology has sprung up as a separate profession, and sanitation looms up as a new profession, because the new knowledge demands agents for its application, and members of the medical profession have failed to act as such agents. Very few medical men know anything about the practical side of preventive medicine, either in the field of sociology or of sanitation. Physicians as a body do not seem to realize that the application of such knowledge is part of their function, for which they should receive a financial return. Thousands of physicians to-day scarcely earn a living, as they sit quietly in their offices waiting for opportunities to exercise the healing art when the world about them is looking for competent agents to apply the modern knowledge of preventive medicine and is willing to

pay for such services. While physicians are starving, sociologists and sanitarians are earning good livings.

Why are medical men not practicing preventive medicine and reaping the harvest from such practice to which they are entitled? Because they have not been trained to do so. The blame lies at the doors of medical colleges. Up to the present time only one medical school in America, and so far as I know in the world, has a chair of preventive medicine and that has been established within a year. Very little has been taught about preventive medicine in medical schools and that little has been theoretical. Some medical schools have had chairs on hygiene or at least a course in hygiene, but the teaching has been entirely theoretical and has been a negligible quantity at that. Nowhere, so far as I know, has a medical student been taught the practical side of preventive medicine, and nowhere has he been shown or made to understand how he could put the application of knowledge of preventive medicine to practical use for earning a living. Everywhere the subject has been looked on as a kind of a side issue in the training of medical men, having no bearing upon their future lives.

The neglect of preventive medicine in medical colleges is perhaps due, in the United States at least, to the manner in which medical colleges have been conducted. Inasmuch as our colleges have not been endowed and have had to spring from the initiative of medical men, they have had to be conducted to some extent as commercial enterprises, and commercialism has of necessity played a part in them. Teachers have had to be practitioners of medicine as well, and through the weakness of human nature professorships have become better leverages for getting practice than for advancing scientific medicine. The result has been that preventive medicine has had its development largely on the outside of medical schools, and has been but poorly understood by the professors of medical colleges. It has not in any sense entered into their studies, their occupation, and their livelihood, and therefore has meant very little to them and could not be taught by them.

Governments, in response to the subconscious demand of the public for the practical application of the most advanced knowledge in preventive medicine, have sought agents for this work usually from among the ranks of the medical profession, and have thereby created a kind of a separate special calling for those who have made themselves proficient. By doing this they have helped to keep the general practitioner of medicine out of this field of labor as a means of a livelihood, and have made it difficult for him to enter it. Preventive medicine has in this way gradually come to be looked on as governmental medicine.

Outside medical schools there has sprung up a kind of an academy of preventive medicine in the American Public Health Association, which has gathered into its ranks the men who are interested in this kind of work. This organization had its origin in the need which health officers felt for opportunity to compare notes and get assistance from others fol-

lowing a similar occupation. These health officers were usually physicians, though sometimes laymen, and in all instances were employed by governments, either general or local, for putting into operation such health regulations as had been made from time to time in various communities for protection against disease. The men who went into this kind of business were full of zeal for the public good, had practical minds, but were not always well equipped with knowledge, not through any fault of their own, but because opportunities for getting knowledge were lacking. They did the best they could and it is to their enterprise that we owe the development of the modern field of preventive medicine.

Unconsciously, but quite naturally, a divergence sprang up in time between the healing art and preventive medicine, the latter becoming more and more a government function and the former the field of practice for physicians. For governmental exercise of preventive medicine machinery had to be created and the help of the physician had frequently to be called for. As the public did not yet fully understand and appreciate the benefits of preventive medicine little money was available for the machinery and execution of preventive measures. Practicing physicians were consequently asked to contribute their services gratuitously, and did so, and a system sprang up which demands of the practicing physician services without compensation in all those matters which have to do with the preservation of public health. Moreover, preventive medicine, as a governmental function free to all people irrespective of ability to pay, has come to be the accepted practice, alike by the physician and the public. In the interest of public health the government is the good father who does everything that can be done and gives everything that is to be had to all who apply, without pay or thanks. Contagious diseases must be treated free in institutions paid for out of public taxes, vaccination must be done free, serums, antitoxins, and all material which can be construed to be of use for the preservation of health or the protection against disease, must be made free to all. It looks as though curative medicine itself might ultimately be taken away from the medical profession, perhaps as a penalty for its neglect of that field of work which is and should be its most important field.

What is the remedy? First, we should have in every medical school an endowed chair of preventive medicine. How is such a chair to be established and whence is the money to be obtained for its endowment? There are certain commercial enterprises which are so dependent for their success on the maintenance and advancement of public health, that the men interested in them could easily be made to see the advantage of establishing chairs of preventive medicine in our medical schools. These are the insurance companies. The great wealth which the insurance companies have accumulated in recent years has been largely the result of the advancement in preventive medicine, and the men engaged in insurance business recognize this fact better than anyone else. Besides these men there are many philanthropic men to whom the sentiment of doing something for the alleviation of human suffering appeals very strongly, and who, therefore, could easily be interested in an undertaking of this kind.

These chairs when established should teach preventive medicine not only from the theoretical, but also from the practical, point of view; and they should at the same time familiarize the medical student with methods of applying the knowledge for a financial return. They should teach students how to instruct people in the prevention of all contagious diseases, and should give them practical instruction in disinfection and sanitary engineering. The modern physician should be able to tell the family how to avoid getting preventable diseases, what to do when a member of the family has been stricken with such a disease so as to make it absolutely certain that no other member gets it, how to disinfect scientifically a house which has been occupied by a person suffering from a contagious disease, how to prepare a vacant house before moving into it, so as to be absolutely secure against contracting contagious diseases, how to build a house in a perfectly sanitary manner, and how to maintain it so. He also should know how to obtain an honorarium commensurate with services rendered through such advice and instruction. The chairs teaching these subjects should, moreover, exercise an influence on the community to bring about a fairer recognition of the physician's services in matters which appertain to public health. The doctor should be paid by the community for all the things which he does for the public, in the same way as other men are paid for their services. When he reports diseases to the Board of Health he should have compensation for his services, and he should be protected in his profession against the encroachments of institutions and public offices under the guise of either philanthropy or the public good.

Secondly, the medical profession as a body should do all in its power to recover its birthright and resist further encroachment on its legitimate domain. Unless this is done, scientific medicine is in danger of suffering a halt in its progress. The ability necessary for a successful career in medicine will not be attracted to the profession, with privation and want confronting the average practicing physician. Fathers will steer their sons into other careers than that of medicine when they once realize that this career no longer is attended with prosperity and honorable success.

The medical profession is now pretty well organized. It should use its organization for re-adjusting itself to advanced medical thought, and for moulding legislation and society in such a way as to weave the teachings of scientific medicine into our laws, customs, and habits, without destroying the profession which gave birth to them. Competent, well trained physicians should be sent to our legislatures and able, experienced physicians should be made counsellors of all governments, so that the most advanced medical thought should have a hearing in the enactment and execution of all law. The profession should, however, at all times stand for law, and not for opinion and arbitrary action, and should insist that nothing should be read into the law which has not been put into it by the people. Much of the injury which has come to the medical profession in the application of preventive medicine has come from the arbitrary dictum of the physician in public office, who, with more zeal than good judgment, has often exceeded the law in his interpretation of it.

THE CANCER PROBLEM.*

By LEO LOEB, M. D., of Philadelphia.

We can approach the cancer problem from the standpoint of the physician who is concerned with its practical aspects, who wishes to learn how to prevent and how to cure cancer, and by what means it destroys the health of the patient, and we can also consider it from the point of view of the investigator, the biologist, who is concerned with the phenomena of life. The latter is deeply interested in the problem of tumors, and especially of cancer. From a study of these phenomena he hopes to gain a deeper insight into one of the most important attributes of living matter, into its power to grow and to proliferate.

In this necessarily brief and very incomplete sketch, I shall try to consider the cancer problem from both these points of view, at the same time limiting myself to a few only of the many sides of this problem.

Let us, first, for a short time consider the problem from the point of view of the physician.

Every organ of the human body can be attacked by cancer, but certain organs are much more frequently affected than others. At first there is a localized swelling that enlarges. Frequently the cancer breaks through the surface of the organ, and a part of the tissue may break down. Sooner or later other parts of the body, especially the lymph glands, the liver, and lungs, become the seat of similar tumors, and at last the patient dies in an emaciated condition.

Cancer is not restricted to any special race of men; it is found in all races, but with very unequal frequency. Thus, the aborigines in tropical Africa are rarely affected; the same holds good of the natives of all the tropical countries. Even in different parts of Europe cancer occurs with unequal frequency. Thus in the countries situated around the Mediterranean and in Hungary cancer is found less frequently than for instance in Switzerland and in Denmark, where cancer is more common than anywhere else in Europe.

The question arises whether those differences in the cancer morbidity are primarily questions of race or whether they are due to the external conditions under which the races live. This question has not yet been

*Read before the Society of Biological Research Workers of Washington, D. C., on April 9, 1910. It has been the aim of the writer to explain the technical terms used, whenever feasible, in consideration of the character of the audience, which included botanists and chemists.

References to previous researches of the writer and of other investigators, on which the conclusions presented in this paper are based, can be found in other communications of the author and have been omitted here for the sake of brevity. Some of the facts mentioned have not yet been published elsewhere.

answered satisfactorily, but it seems to me that America, where immigration of different races has taken place, might be favorable for such a study. Inasmuch as in the American negro cancer is more frequent than it is among the African negroes, it might appear as though environment and conditions of life were the principal factors concerned; it is very probable indeed that these factors are of great importance. On the other hand, we have to consider that inter-mixing of the races has taken place, so that in this case the action of the race factor cannot be entirely excluded.

We also find that in different countries different organs are attacked with unequal frequency, and this is due certainly to a great extent to the different habits that prevail. Cancer of the lip is found to be frequent only in people that smoke; and, in a similar way, cancer of other organs can to some extent be accounted for by considering the different habits of various peoples.

We find other variations in the incidence of cancer, namely, in regard to the time factor. In all countries in which statistical records of all the deaths occurring are kept, a constant definite increase in the frequency of cancer has been noted. In the United States 90 persons per million inhabitants died from cancer in 1850, while in 1900 the death rate per million inhabitants was 430. In Germany there was from 1876 to 1895 an increase in the rate of death due to cancer of approximately 115 per cent., while the increase in population in the same period amounted to only 23 per cent. A similar increase has been observed in other countries.

This increase is the more surprising, because the mortality of certain other diseases, especially tuberculosis and the infectious diseases in the restricted sense of the word, is constantly decreasing. This increase is, however, by some investigators interpreted as only apparent, and is explained as mainly due to a better recognition of the disease—an interpretation against which some serious objections can be raised. However that may be, there can be no doubt as to the wide distribution and the great importance of this disease.

During the greater part of the nineteenth century the study of cancer consisted mainly in a microscopic study of the various tumors, of their mode of origin, and of the paths along which the cancer spread in the body, and these studies led to some very interesting observations. Some preliminary explanation concerning certain technical terms may first be given.

Our body consists of cells, and certain varieties of cells form larger combinations, which we call tissues. The morphological and chemical character of the cells of different tissues is different. Those cells which cover the skin and certain internal organs are called epithelia and the other cells that are situated beneath the epithelial lining and that connect the various tissues are called connective tissue. Normally, the arrangement of different tissues and the boundary line between them is quite

definite. In studying early stages of cancer, cancer of the skin, for instance, we see that such a definite arrangement is lost, and that the epithelial cells which form the outer lining of the skin begin to grow down into the underlying layer of connective tissue. This downgrowth is usually limited to a very small, localized area. While in normal skin the line of demarcation between the epithelium and the underlying connective tissue is sharp, in the case of the beginning cancer both kinds of tissue are intermixed, the epithelium penetrating downward into the connective tissue; secondarily, the surrounding connective tissue likewise begins to proliferate, and thus a swelling, a tumor-like mass, may be produced. The growing epithelial cells do not respect any opposing tissue. They are able to destroy cartilage and bone and can penetrate the wall of the lymph channels and of the blood-vessels. With the circulating blood or lymph they may be carried into different parts of the body, into a lymph-gland or into the liver, for instance. Here the tumor cells are retained and frequently begin again to proliferate, forming a tumor similar to the one found at the primary seat. At first the cancer cells grow inside the lumen of the lymph or blood channel, but very soon they break through their wall to the outside and then a growth takes place in the organ proper. Such a secondary growth is called a metastatic tumor.

We see that tumor growth depends on the activity of those cells which had been transformed into cancer cells in a restricted area and later spread into other parts of the body; it is quite different in infectious diseases, in which, not the body cells, but the microorganisms, spread in the body and cause new cells at different places to proliferate. Usually cancer takes its origin at one place of the body only; but in some cases it may happen that a simultaneous proliferation takes place at different parts of the body or at different parts of an organ; for instance, it occasionally happens that multiple areas of the outer skin become cancerous at the same time. In other cases cancer may simultaneously occur in different organs of the body.

The same changes that I have just described in the case of cancer of the skin may take place in almost any other tissue, and we designate the different tumors according to the tissues from which they originate. Thus, a cancer taking its origin from the epithelial tissue is called a carcinoma, and a cancer originating in the connective tissue is called a sarcoma. On the whole, a tumor preserves its morphological and chemical characters throughout; but certain variations in the character of cells have been observed, and to some very marked variations we shall later have an opportunity to refer.

Such were the principal results obtained through the microscopic study of human cancer as it was practiced during the second half of the nineteenth century. On the whole, the data brought forth through a continued microscopic study taught us to differentiate between various kinds of tumors, according to the variety of tissues in which the proliferation started. But the number of variable factors in such phenomena of growth

is very great, and by mere morphological observation it was found impossible to eliminate these variable factors. Thus an exact solution of the problem being impossible, a period set in in which hypothetical speculations acted as a substitute for real facts. This epoch, which we have not quite overcome, has been productive of a legion of hypothetical explanations which, in the large majority, have not been well founded, and will merely retain some historical interest. They are frequently based on a limited number of histological observations and are therefore entirely inadequate to do justice to a very complex reality.

In order to eliminate those variable factors as much as possible it was necessary to use the same methods that are employed for this purpose in other sciences—we had to resort to experiment. In order to carry out such experiments it was necessary to recur to animal tumors.

Tumors have been observed to occur in the various classes of vertebrates, but their frequency varies very much according to the species of animals. To mention some examples, tumors are extremely rare in guinea-pigs, and almost as rare in rabbits; they are very common in dogs, white mice, and white rats. It has been suggested that animals living in a wild condition are less apt to be affected by tumors than domesticated races. This, however, has not yet been conclusively proved. Thus it seems that tumors are relatively common in the grey rat and also in the grey mouse, and tumors have also been found in wild animals kept in zoological gardens. The varieties of tumors found in animals are identical with those observed in man; but it is noteworthy that certain species of animals have tumors that are more or less characteristic for the species to which they belong. Thus, in the white rat connective tissue cancer is relatively common, while in the white mouse epithelial cancer of the mammary gland predominates; in cattle in the United States carcinoma of the inner angle of the eye is the typical form of cancer, while in Europe this kind of cancer seems to be rare or to occur not at all.

Cancer has also been observed among birds, reptiles, amphibia and fish; but in cold blooded animals tumors are on the whole very rare.

In order to get a deeper insight into the growth of tumors it was necessary to undertake the experimental study of animal tumors. Such a study was rendered feasible through the discovery that under certain conditions it is possible to transmit a tumor from one animal to another. This can be accomplished very easily in mice and rats, and the majority of experiments have been carried out in those rodents. But tumors can also be propagated in other animals. In order to transmit a cancer from one animal to another we have to inoculate a very small particle of the tumor under the skin of the mouse or rat, and if such an inoculation is successful the tumor will begin to grow and become visible to the naked eye in a period of time that varies between one week and several months, according to the tumor used. The rapidity of growth also varies in different tumors. The process of inoculation is hardly more painful than a subcutaneous injection which the physician frequently makes for thera-

peutic purposes, and the subsequent growth of the tumor is not connected with any pain sensation. When the tumor has grown to any considerable size the mouse is usually chloroformed. What takes place after the inoculation of a very small fragment of tumor? The cells in the centre of the piece usually die, but the peripheral cells, which are nourished by the fluids of the host, remain alive, and they soon begin to divide by mitosis and give rise to the new tumor formation. It is absolutely necessary to inoculate living tumor cells into the other animal, otherwise the results will be negative. The number of cells inoculated, however, may be very small and one single cell injected may be sufficient in certain cases to make the inoculation successful. In this respect the transmission of cancer differs, therefore, considerably from the transmission of common infectious diseases, in which it is necessary to transfer not the body cells but merely the microorganisms from one organism to another. In cancer, cells must be transmitted. Thus it becomes readily understandable why usually it is not possible to make the tumor of one species grow in another species for any length of time. It is, for instance, not possible to make a human cancer or cancer of a dog grow in a mouse, nor is it possible to make the tumor of a mouse grow in a guinea-pig. Even in relatively nearly related species tumors do not grow. Thus the tumors of a rat do not grow in a mouse for any length of time; although for a short period they may grow, but then they rapidly retrograde and disappear. This behavior of tumors can easily be understood if we consider that transplantation of tumor means the transmission of the tumor cells; and these tumor cells retain all the characters of the species which the normal cells of an organism possess. We must assume that the chemical structure of the proteids of animals belonging to one species differs from the chemical structure of the proteids of animals belonging to another species, and that these specific proteids are adapted to certain substances circulating in the body fluids, much as a key is adapted to a certain keyhole. Each tissue finds, therefore, the nourishing material in the animals of the same, but not of other, species. Thus, if we transplant skin from one guinea-pig into another guinea-pig, it may live a very long time, perhaps permanently; but if we transplant that same skin into a rabbit or into a pigeon, the skin lives, and may even show a small increase in the number of cells for a few days, but after this brief preliminary period it invariably dies. Cancer cells behave in this respect like ordinary tissue cells. Different varieties of cancer are, however, not equally sensitive to changes in hosts. Thus a certain sarcoma found in dogs can be transmitted even to the fox, which represents a different, though closely related, species. On the other hand, carcinomata of the mouse have been found to be very sensitive to differences in the character of the host. A tumor, for instance, which has originated in an American strain of white mice grows with very much greater difficulty in white mice that have been bred in Europe.

We can easily understand such differences if we consider the probability that the chemical composition of the protoplasm of the cells is dif-

ferent in different strains of the same species, that such differences in the character of the cells determine a corresponding difference in the circulating food-stuffs that nourish the cells, and that the difference in the food-stuffs renders the growth of ordinary cells, and especially of tumor cells, more difficult. Very frequently the specificity in the adaptation between body cells and nourishing body fluids is still more pronounced, and the majority of tumors cannot be transplanted successfully, even into animals of the same species and the same strain. But such tumors as do not grow in other animals of the same species and the same strain may grow if they are transplanted into the same individual in which the tumor had originated; this shows a still finer adaptation between tumor cells and the body juices, and it agrees very well with a recent important discovery of von Dungern's, according to which it is possible to distinguish by biochemical means even between certain individuals of the same species. Individuals of the same species differ, therefore, in their chemical structure and react, therefore, in a different way against their own transplanted cells and the transplanted cells of another individual of the same species.

Let us now assume that we have succeeded in transplanting tumor cells into a number of individuals of the same species. What becomes of these tumor cells after they have lived for some time in their new hosts? Does their power of proliferation now gradually decrease, and do they die simultaneously with the individual in which the tumor originated? Experiments have conclusively shown that this is not the case. From the second generation such tumor cells can be transferred into a third generation and into a fourth, and so on apparently indefinitely. This holds good for connective tissue tumors as well as for epithelial tumors, both have been kept alive in other individuals for a long period of time; they survived the animal in which the cancer had originated. Thus one tumor found in Copenhagen has been kept alive through a period of more than eight years and during that time the cells continued to propagate at an extraordinary rate. All other tumors that can be transplanted behave in the same way. This is a fact of the greatest biological significance. In order to appreciate its importance we must refer to some of the fundamental conceptions of biology. In the multicellular animals, the Metazoa, of which the vertebrates form one group, we distinguish two kinds of cells, the germ cells, ova and spermatozoa, which propagate the species, and all the other cells, which are called somatic cells. The cells of the skin, the muscle, nerve cells, and so on, all are somatic cells. Now we know that the somatic cells die with the individual of which they form a part, while the germ cells do not necessarily die with the rest of the body, but have the power to give origin to new individuals indefinitely. While, therefore, the germ cells possess the potentiality of immortality, the somatic cells are supposed to be hopelessly mortal. In regard to the unicellular animals, the Protozoa, Weismann claimed for them potential immortality, inasmuch as one individual divides directly into others to which

it transmits its protoplasm, a process which safeguards the continuity of their body. Later, however, other investigators, like Maupas, Hertwig, Calkins, and others, came to different conclusions. They noticed that in propagating a certain strain of Protozoa, as for instance *Paramœcia*, these organisms do not retain their vitality constantly, but that after a period of active division, the Protozoa begin to show signs of deterioration, and without conjugation of two individuals the strain is in danger of dying out. These later investigators believed, therefore, that the Protozoa are subject to death in the same way as the Metazoa and that only a certain part of their protoplasm which conjugates with part of the protoplasm of another individual of the same race, escapes death and is immortal; this latter part corresponds to the germ protoplasm of the Metazoa, while the rest of the protoplasm that dies they regard as the homologon of the somatic portion of the metazoan body. If we analyze somewhat more closely the arguments used in favor of the conception that the somatic cells of the Metazoa are necessarily mortal, we find that they are based on hypothetical considerations and that no convincing proof has been given that the somatic cells cannot live indefinitely. The experimental investigation of tumors brought forth facts that point very strongly to the converse conclusion, namely, that, if not all, at least very many of the somatic cells are potentially immortal in the same sense as is generally recognized in the case of the germ cells. It seems to me difficult to conceive of any other conclusion, if we find that the tumor cells, which are merely, a special kind of somatic cell, propagate indefinitely through periods of years long after disintegration has set in in the body of which the mother cells that gave origin to the tumor elements formed an integral part, and especially if we consider that at the present time there is not yet the least sign noticeable of a decreasing energy of growth of these tumor cells. Furthermore, this conclusion holds good of connective tissue as well as of epithelial cells, and it is probably equally true in the case of cartilage and certain other cells.

Under the conditions under which animals actually exist, their somatic cells do indeed cease to live at the time when the nervous system and the heart discontinue their activity. This, however, may be merely the result of unfavorable environmental conditions that exist in the body at the time of the death of the animal, and if transplanted from the aged or dying into a young individual of the same species the tissues in all probability would continue to live. To the same conclusion recent experiments that concern the life of Protozoa point. It appears that in this case also the period of depression and death noted by former investigators, periods of depression from which recovery is sometimes possible by means of conjugation, are not inherent in the structure of the protoplasm of the unicellular organism, but are caused by unfavorable environmental conditions, by lack of proper food, and especially by lack of the proper variation in the nourishment. To the older view we can, therefore, oppose, on the basis of important evidence, the other conception that many somatic

cells, as well as many Protozoa, have the potentiality of immortality, and that in the service of the mortal individual animal these somatic cells sacrifice their immortality.

We say that the tumor cells can be propagated apparently indefinitely from generation to generation. We have said also that in the course of this propagation no decrease in the energy of growth need take place. Does this indicate that the energy of growth is a non-variable factor, remaining constant under all conditions? This is not the case. The energy of tumor growth can be experimentally changed; it can be increased and can be decreased. An increase of the energy of tumor growth takes place almost immediately if we transplant a primary tumor, a tumor that originated spontaneously in a certain animal, into another individual. In the course of the first, second, and sometimes also the third, generation, the tumor gains in rapidity of growth often quite markedly. We see, therefore, that the original tumor grows relatively slowly, and that in the animal in which all the conditions were present that made possible the conversion of normal tissue cells into tumor cells, the energy of growth of these tumor cells is lower than in other animals in which no special, favorable conditions existed for the formation of the tumors. Thus, the curve representing the energy of tumor growth shows an optimum after the first few generations, after which it remains approximately constant, although variations may occur, which, however, are very soon equalized. What is the cause of this typical variation taking place in the course of the first transplantation? Is it due to a restraining influence exerted by the animal originally affected with the tumor growth, a restraining influence that is lacking in other animals of the same species? This is not the correct explanation; it can be shown that we are able to stimulate the proliferative power of the tumor cells without transplanting them into another animal merely by excising a piece of the cancer, and placing this cut out piece in another part of the same individual, or even by pulling a thread through a tumor. Such experimental interferences act, therefore, as formative or growth stimuli, increasing the proliferative process of the tumor. This fact explains an observation that surgeons have frequently made. It has been noted that if operative excisions of a tumor have been incomplete and if from the very small remnant of the tumor a new cancer begins to grow this so-called recurrent cancer frequently proliferates much more rapidly than the first tumor. In this case also the proliferative energy of the tumor cells has, therefore, been stimulated through external means. On the other hand it is possible experimentally to decrease the virulence of tumor cells, to make rapidly growing cancer grow very slowly after transplantation. This can be accomplished in the following way: After excising a piece of tumor we expose the tumor in a test tube in the thermostat to a temperature slightly above the body temperature, for instance 44°C. According to the length of time during which the tumor tissue is exposed to that temperature, the energy of growth generally decreases; exposure of from 10 to 20 minutes changes its proliferative power very

little or not at all—but heating it for 25 minutes depresses its growth somewhat; an exposure of 35 minutes has a very distinctive influence; after heating it for 45 minutes the tumor growth becomes slight and is still more markedly decreased if we heat it during one hour. If we transplant into animals of the suitable species particles of cancer that have thus been exposed, we can readily recognize the decrease in the virulence of the cancer that has been subjected to heating before inoculation. Exposure to the action of certain chemicals, such as glycerine and very weak solutions of potassium cyanide, act in a similar manner. These experiments and observations are of very great biological interest and importance. They clearly show that if you affect a body cell in such a way as to retard its cell division, a hereditary transmission through many generations of cells takes place, and that not only the cells directly affected, but also their daughter cells, and the third and the fourth generation of cells and so on through many generations, continue to divide more slowly. If the exposure has been too long or too severe, the tumor cells may die after a limited number of divisions; but if the cancer cells begin, though slowly, to propagate, usually a recovery takes place after many cell divisions, and if we continue to transplant such a tumor into other animals the cancer may regain its old virulence. This appears to be very important from a biological point of view. It clearly proves that the injuries to which somatic cells invariably are exposed during the life of the individual of which they form a part, do not necessarily lead to the ultimate death of these cells, as has been assumed by some investigators, but that certain mechanisms exist which, inside of very wide limits, bring about a recovery of the energy of growth and of other vital functions, even without rejuvenation having taken place through a conjugation, as is held by various investigators to be necessary in the case of Protozoa. It seems very plausible that a similar mechanism exists also in the case of Protozoa and that the latter succumb only to a constantly accumulating effect of injuries. These facts, therefore, give a further support to the hypothesis mentioned before, that ordinary tissue cells, as well as tumor cells, may be immortal.

Here again we find that connective tissue and epithelial cancer cells behave in approximately the same manner, confirming thus the fundamental similarity in the physiological properties of various somatic cells independently of their genetic relationship.

If we now expose the cancer cells to the same temperature for a still larger period of time or if we increase the temperature or the concentration of the poisonous chemical substances, the cells die altogether and no growth results after transplantation of particles of cancer thus treated. To the influence of cold, cancer cells are very much more resistant. They can be kept for a relatively long period of time at the temperature of melting ice without losing their power to grow after inoculation into an animal. They can withstand even a temperature considerably below the freezing point without being injured to any very marked degree. These

properties, however, are not characteristic of tumor cells, but so far as our present investigations permit of any definite statement they are common to cancer cells, to many normal tissues, and even to unicellular organisms.

If we study carefully the growth of such tumors of experimentally decreased virulence, we notice that a certain number of these cancers grow for a certain period of time, and then, instead of continuing to grow as cancers usually do, their proliferation ceases at first, and they begin to disappear, until within a relatively short period of time they disappear entirely and nothing indicates that a cancer ever had grown in such an animal. Similar retrogressions occur occasionally also in ordinary transplanted tumors; the frequency, however, varies according to the variety of cancer used for inoculation.

A retrogression of cancer is a very rare occurrence in spontaneous tumors which did not originate as a result of inoculation. Here, it is very much more unusual than in the case of transplanted tumors. But even in man a few cases have been observed, in which undoubtedly cancer began to retrograde spontaneously and a cure resulted. If we examine such retrograding cancers under the microscope we notice that cell proliferation may continue for a long time, notwithstanding the reduction in size of the tumor, and it is even possible to obtain a new growth from such a retrograding cancer if we inoculate into other individuals. But on the whole, and especially in certain varieties of such retrograding tumors, the cells have markedly lost in vitality, and if used for inoculation are less favorable to the development of large tumors.

All the characters of tumor cells that we have described thus far do not sharply distinguish cancer from ordinary tissue cells; in fact, our considerations have been based on the supposition that they still retain the properties of ordinary tissue cells. And this is indeed the case. That cancer cells exert still some of the functions of the organs from which they are derived, can be demonstrated in various ways. To cite one example that illustrates this fact especially well: It is known that the thyroid gland of man has certain functions which it performs through what is known as an internal secretion; the gland manufactures a substance that is probably discharged into the circulation and the presence of which is necessary for the preservation of health. After the complete removal of the thyroid certain characteristic diseases appear. Now, there is a case on record in which it could be proved that after removal of the thyroid which had become cancerous, through operation, a secondary metastatic nodule of the cancerous thyroid, a nodule, therefore, that itself consisted of cancerous tissue, still produced that internal secretion and prevented the appearance of those symptoms that invariably follow the removal of the gland.

If cancer and ordinary tissue cells are so similar, in what respects do they differ? Cancer cells differ from ordinary tissue cells from which they are derived, in the first place through their increased energy of

growth, and, secondly, through their power to invade and infiltrate other tissues. And, again, both of these properties, as such, are not absolutely characteristic of cancer. We have means of stimulating the growth of ordinary tissue cells to such an extent that for a certain period to time it may in intensity even exceed the growth of cancer cells. A relatively slight increase in proliferative power is, for instance, noticed in wound healing, where the epithelium and the connective tissue grow into the wound until the defect has been filled. A much more striking method of causing a very pronounced tissue proliferation has recently been discovered. It has been found that a certain organ produces at certain intervals a specific substance that unites with the connective tissue cells of another organ. This chemical substance renders those connective tissue cells extraordinarily sensitive to various mechanical stimuli. It sensitizes these cells, as we may express it. Contact with a foreign body causes such sensitized cells to grow enormously and within a few days they reach the size of a tumor. But after a relatively short period, this proliferation ceases again simultaneously with the cessation of the internal secretion which called forth its growth. Cancerous growth differs from such proliferation in being constant. The increase in proliferative energy is not temporary, but continuous; and such a continuous proliferation we have not yet been able to produce at will experimentally, and this is one of the reasons why the cancer problem cannot yet be regarded as solved. Temporary tumors we can produce at will—but not real cancers, which grow permanently.

The second characteristic property of cancerous growth is its power to infiltrate and to destroy the surrounding tissue. But even this power is not an absolutely unknown quality. During embryonic development certain cells of the outer layer of the embryo normally penetrate into the surrounding tissue to which they are attached and which nourishes them. Here again we have to deal with a passing phenomenon, while in cancer the infiltrative growth is permanent.

Cancer cells differ, therefore, from other cells in so far as they have constantly certain characteristics which other body cells possess, if at all, only temporarily. And one side of the cancer problem is to find means of producing such an increased energy of growth and an infiltrative growth permanently. Under certain conditions we have, however, succeeded in producing experimentally a new tumor. If we inoculate an epithelial cancer, a carcinoma, into a mouse or rat, we have observed, in a certain number of cases, that there developed in the inoculated mice, not only a carcinoma, but also a connective tissue tumor, a sarcoma, and both these tumors could then be separately propagated in other individuals. This remarkable fact has been observed in a number of tumors and at various periods after the inoculation, and it is probably due to a stimulating influence of unknown nature which the cancerous cells exert upon the surrounding connective tissue. Similar observations have been made in man. A person at first suffered from epithelial cancer of the thyroid and was operated on

twice. In neither operation was it possible to excise the tumor completely; a few cancerous cell nests remained, and gave rise to a recurrence and to secondary nodules (metastases) in other organs. In the recurrent tumors and in the metastases, however, the epithelial cancer, the carcinoma, was gradually replaced by a connective tissue cancer, a sarcoma. Here the explanation is probably similar to the one given in the case of the experimental work: The cancerous epithelium transmits to the surrounding connective tissue a certain stimulus of growth. Such an occurrence explains probably also the fact that in certain cases we find in man and in animals in the same organ simultaneously two cancers, a carcinoma and a sarcoma; one of the two tumors being at first the only cancer present but causing secondarily the second cancer, the sarcoma, or the carcinoma, to be produced by the normal tissue. But even in the experiments just mentioned, we cannot be entirely satisfied with our experimental results, inasmuch as we cannot produce such a transformation of normal connective tissue into sarcoma at will; it sometimes happens to take place, while at other times we do not succeed. There are here evidently some variable factors present which we do not yet recognize and control. Or we might cite certain tumors developing in man under the influences of the Roentgen rays. In this case, also, we evidently do not yet control all the variable factors, inasmuch as we have not yet been able to reproduce such a change at will in animals.

We have now followed the activities of cancer cells and we have studied their behaviour under different conditions. This, however, is only one side of the problem. Cancer is a struggle between a number of cells of a certain organism against the rest of the body. It is an insurrection, in which, we regret to say, the insurgents have so far been victorious in the large majority of cases. As in every other war there are two armies. Let us now observe very briefly the activities of the other side and see what efforts they make to resist the invading enemy. As we mentioned above, the resisting powers in individuals affected by spontaneous cancer are very slight, but sometimes it takes many years, at other times, a few months, before the battle is ended. That depends partly upon the virulence of the cancer cells. Some varieties of cancer have much greater propagating and invading powers than others; partly it depends on the resistance offered by the patient. And here it has been observed that cancers frequently progress much more rapidly in vigorous young persons than in old individuals. Thus far our investigations into reactions taking place in the individual in which the cancer developed spontaneously, have necessarily been incomplete, although to some important observations we shall have occasion to refer later on. We are in a much more favorable condition, when we wish to study in animals the behaviour of the organism in cases of inoculated tumors. And here some very important facts have been disclosed.

In the first place, many animals resist successfully the growth of particles of tumor with which they have been inoculated. These individuals

are naturally immune. Such natural immunity may in part depend on the constitution of the body fluids, the blood and the lymph, not favorable to the growth of the implanted cancer cells or it may be due to the reaction of the host cells which surround and invade the foreign cancer tissue. In a similar way, after transplantation of normal skin into a nearly related species in which the skin cannot grow successfully—for instance, after transplantation of guinea-pig skin into a rabbit—we notice that during the first week after transplantation, the epithelial cells of the guinea-pig skin may proliferate to a slight extent, but soon the growth ceases and the transplanted cells die. In a similar way the transplanted cancer cells may grow during a short period of time in an animal that is naturally immune, but here also the cells die very soon. Sometimes, however, an animal which resists one or two inoculations may not retain its immunity indefinitely but may succumb later to a successful inoculation.

Other animals are not naturally immune against the growth of inoculated tumors, but they can be made to become immune through experimental means. This can be done for instance, by inoculating an animal with cancer material of experimentally decreased virulence. As we have stated before, tumor cells that before inoculation had been exposed to a moderate degree of heat in many instances grow after transplantation, but after some time the growth ceases and then the tumor retrogrades. Now, it has been shown that such animals, in which the tumor has retrograded, have thereby become immune against cancer growth. In most cases they cannot be inoculated successfully a second time with particles of cancer previously not heated and therefore retaining their full virulence. Those animals that have been inoculated with heated material and in which the cancer cells of decreased virulence did not give origin to a temporary tumor formation, have not become immune through such inoculation, or at best have gained only a very slight degree of immunity. We see, therefore, that the actual growth of the tumor cells causes a reaction in the body of the host that leads to the mobilization of those forces that enable the organism to resist successfully a second attack, and that even induces after an initial period of growth the retrogression of the tumor. In a similar way it has been found that an immunity against pathogenic bacteria can, in certain cases, more easily be accomplished through the injection of living, than of previously killed, bacteria. That such defensive reactions take place in the animal in which a tumor is growing, is also evidenced by the fact that in certain varieties of cancer an animal in which a cancer is growing cannot be inoculated a second time with the same kind of tumor. Other means have been discovered by which it is possible to immunize animals against a successful inoculation with cancer. The methods used are again similar to those applied in infectious diseases. In order to immunize man against smallpox he is inoculated with an attenuated virus, the vaccine. If we inoculate mice with particles of normal mouse organs or with certain cancers that do not grow after transplantation, the animals thus treated become immune against inoculation with

virulent tumor in a very large number of cases. This is due to the fact that cells in the normal organs and in the tumors have certain chemical constituents in common, which, after injection, are absorbed and give rise to defensive reactions that protect the animals against the growth of cancer cells.

In the case of diphtheria and other infectious diseases we can immunize animals by the repeated injection of the bacilli or their toxins, and afterwards we can transfer the immunity thus produced to other individuals of the same or other species. In this case the immunity present in the animals injected with bacteria or their toxins is due to the production of new substances, the anti-toxins or the anti-bacterial substances, and these substances can be transferred from one animal to another in a manner similar to that in which ordinary chemical substances can be introduced into an animal. The methods employed in diphtheria have been used for procuring curative blood sera against cancer. Many attempts have been made to produce substances which might be able to destroy the tumor cells and thus to procure a cure. For this purpose human cancer tissue has been injected into animals with negative results so far as the curative properties of the serum was concerned. In other experiments rabbits have been repeatedly injected with the cancer of mice; but the rabbit-serum thus obtained did not possess when injected into mice and properties decisively either curative or preventive. Whether the serum of animals that after recovery from a transplanted growth have become immune against a second inoculation has anti-cancerous action, injurious to the life of the cancer cells, has not yet been fully decided. Notwithstanding these, in part unsuccessful, attempts we thus see that the organism under various conditions is able to react against the invading cancer cells, and this fact encourages us to look forward with hope to the result of further investigation.

Let us now leave the field of theoretical research into the nature of cancer and into the life of the cancer cells, and return for a short time to the point of view of the physician, and learn what he can teach us regarding the cause and the cure of cancer.

If we inquire into the cause of tumors, several established facts stand out prominently. In the first place, external factors are of extreme importance in the etiology of cancer. In very many instances we notice that cancer is the result of chronic irritation of various kinds. Cancer of the lip is almost invariably found in places where chronic irritation due to smoking has injured the lip. In India and Ceylon, carcinoma of the mouth is not uncommon among women who are accustomed to chew the betel nut. In Kashmir, it is customary for the natives to carry small stoves that press against the skin of the abdomen and frequently burn it. As a result of such repeated burns, cancer develops in the skin of the abdomen in a relatively large percentage of cases among the inhabitants of Kashmir. Cancer of the gall bladder is frequently preceded by gallstones, which irritate the gall bladder, and cancer of the stomach develops frequently as a

result of an ulcer of the stomach. In a similar way, chemical irritants of various kinds are liable to produce cancer. Thus, in chimney sweeps and in tar and paraffin workers cancer is relatively frequent, and in aniline workers cancer is found in certain organs. Furthermore, it occasionally develops in persons who take arsenic over a long period of time, for the purpose of curing certain kinds of diseases. We have mentioned before that it develops frequently in physicians who have exposed their skin to the action of the Roentgen rays without being protected by a screen. Thus, we find that a large proportion of earlier Roentgen ray technicians developed carcinoma of the hand and of the arm. Light may act in a manner similar to Roentgen rays in persons especially sensitive to the influence exerted by the short wave light rays. Thus in sailors, carcinoma of the skin develops occasionally. Even a single injury may sometimes be followed by cancer; and in this case it is usually a connective tissue cancer, a sarcoma that follows traumatism.

There are other factors of importance. During embryonal development certain cells or tissues or parts of organs may become misplaced. Now it has been observed that such misplaced embryonal rests may give rise to benign, tumor-like structures; and it has furthermore been observed that parts of such benign tumors undergo a transformation into cancer in a certain percentage of cases. Why it is, that such embryonal malformations are especially liable to become cancerous, we cannot state at the present time. Experimentally we have not been able to produce a cancer through misplacement of embryonal tissue.

It is likewise doubtful what part heredity plays in the formation of cancer. There can be no question that many cases have been found in which numerous members of a single family have fallen victims to cancer, and that such a tendency could be noted through several generations. Especially well known is the case of the family of Napoleon Bonaparte. In many other cases, however, no indication of hereditary transmission is noticeable, and at present we must leave the question as to the importance of hereditary factors undecided, although the weight of the evidence seems to me to point to the conclusion that heredity may play a part in the causation of cancer. To cite an instance where hereditary factors may indirectly be important: It is well known that certain pigmented moles are frequently transmitted from one generation to another, and it is certain that such pigmented moles may give rise to pigmented cancer of the skin of a very malignant type. In this case there is no doubt that indirectly heredity plays a role in the etiology of cancer.

One possible etiological factor that has led to more discussion than any other problem connected with cancer has still to be mentioned. I refer to the possible part played by parasites of various kinds. It is well known that in plants various fungi and insects, through chemical or mechanical stimulation, are able to call forth the production of simple or complicated galls, which in some respects resemble tumors. We also know that in animals various parasites can cause a proliferation of various tissue

cells. But such tissue proliferations, in which parasites are found, differ, as far as we know at the present time, from the real tumors. In cancer no definite parasite has been found the presence of which is so regular or so specific that it could be recognized as the cause of the disease. On the other hand, certain facts could best be explained by the presence of a living agency calling forth the cancerous tissue proliferation. To cite one of the most important facts: In certain cases cancer in animals has been found to be endemic; it occurs very much more frequently in certain places and in certain families than in others. But this endemic occurrence of cancer might also be due to family or hereditary conditions or to a common influence of food. In the cases known so far, the infective cause of such an endemic occurrence has not yet been proved. Future investigation, however, must decide these questions.

A few words may be added in regard to the treatment of cancer. In the beginning, cancer is in the large majority of cases a strictly localized disease, and by a very early, thorough operation a definite cure may be attained. At later stages an operation frequently fails to eradicate the disease. In certain superficially situated cancers Roentgen or radium rays may lead to a cure, but they usually fail in cancers that are situated in the deeper tissues. Quite recently some excellent results have been achieved in advanced cases of carcinoma by the injection of the peritoneal fluid obtained from another patient suffering from cancer. It appears that in cancer reactions may take place in the patient that lead to the production of immune or sensitizing substances. It is, however, as yet much too early to make definite statements as to the mode of action of such fluid. Our experimental studies certainly have demonstrated the existence of such reactive processes in the individual affected by cancer as lead to a cure in a certain number of cases. I believe that we may look into the future hopefully and, perhaps very soon, but certainly sooner or later, we shall be able to control the conditions leading to the development of cancer; furthermore, that we shall be able to find more powerful curative agencies than we possess at the present time. We may, however, be sure that the most rational treatment will be based on purely scientific investigations into the ultimate nature of that kind of exaggerated tissue growth which we call cancer.

CASES SIMULATING ABSCESS OF THE LIVER.

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The diagnosis of liver abscess is always important. Operation, if timely, will be followed by recovery. If there is no operation, or one is done too late, the patient may die of exhaustion or from rupture of the abscess, or may become a chronic invalid with fistula into a bronchus or pleura. An important aid to the diagnosis is to suspect the disease. At the present time, liver abscess is almost always amebic, generally single, and tends to become large. This so-called tropical abscess is very frequent in the Mississippi Valley, and occurs occasionally outside that area. The symptoms vary widely, from the latent type—in which only careful physical exploration can reveal the condition—to cases with large and painful livers and severe general symptoms. In the latter, the general symptoms may predominate, and I am able to cite cases in which rose-spots were searched for and Widal tests made, when physical examination would have revealed abnormal lines of liver dullness, that indicated exploratory aspiration. A history of dysentery, either an amebic dysentery as proved by the microscope or a history of the recurring dysentery so characteristic of amebic infection, always adds to the suspicion. The first case to follow shows some of the difficulties and the methods that may be used in coming to a conclusion. The case would have been of great scientific interest if it had been possible to follow it up. As it was, the diagnostic and therapeutic features are of chief interest.

L. O., 44 years old, married, saw-mill hand, was admitted to the medical wards of the Charity Hospital, New Orleans, December 9, 1909, having been sent in from the Out-Patient Department with a diagnosis of "abscess of the liver." He complained of pain in the left side of the epigastric region.

He had had gonorrhea and malaria, and for 5 years a diarrhea lasting 4 or 5 days at a time, alternating with constipation, and checked, but not cured, by medical treatment. Two months before admission he was struck on the abdomen, at the spot now painful, by a flying stick of wood. Uses alcohol very moderately.

Present illness began 17 days ago with severe pain in the left epigastric region. This has continued. Has lost 7 pounds (from 142 to 135 lbs.).

Physical examination negative except as regards liver region. The lung-liver border is at the level of the sixth rib in the right nipple line, and shows no abnormal curves. The lower border can be felt as a rather hard, sharp edge, reaching the level of the navel, and running up in a curved line toward the costal margin. Just above the edge a roundish

elevation can be seen about three inches in diameter and showing distinctly above the surrounding skin and the prominent bellies of the rectus muscles on both sides. The swelling is smooth, firm and elastic, not fluctuating, and moves with the liver in respiration.

The hemoglobin is 90, leucocyte count negative. Blood pressure 135. Examination of (formed) stool for amebæ negative. Temperature normal.

On account of the painful swelling of recent development and the history of diarrhea the diagnosis of abscess seemed probable. The possibility of gangrene or abscess from the blow by the stick was considered, but did not seem likely. Examination made a secondary tumor improbable, and a primary tumor seemed less likely than abscess. Aspiration was accordingly indicated, and was done December 13th. Through a large needle attached to a glass antitoxin syringe, fluid was obtained with great ease. At first it appeared as almost pure blood, but more watery; later a number of yellow granular masses, $\frac{1}{2}$ mm. in diameter came, mixed with the blood. Through the barrel of the syringe these looked like pus, and seemed to confirm the idea of amebic "abscess," for it must be remembered this is not an ordinary abscess with pus, but a necrosis, and sometimes fluid very much like that described comes away on aspiration. In one case, in which I got the characteristic "anchovy-sauce" material on exploratory aspiration, the surgeons next day found only watery blood, and doubted the diagnosis until incision revealed the usual contents in the lower part of the same cavity. In the case now reported, however, further examination made abscess unlikely. There were no amebæ, no liver cells, as in early breaking down of an amebic necrosis. The yellow particles proved not to be pus. They were glistening, with smooth walls. Under the microscope they showed medium sized cells, with pale vesicular nuclei, minute nucleoli, and protoplasm with fatty granules and vacuoles.

From this I abandoned the idea of abscess and made a diagnosis of "tumor, possibly of adrenal origin," and advised the patient to undergo an exploratory operation. He consented, and was operated upon by my colleague, Prof. Matas, on December 16th. At that time the condition had not materially changed.

On opening the abdomen the rounded swelling showed plainly on the left lobe of the liver, and revealed a somewhat fluctuating mass below. An incision gave exit to a large quantity of material similar to that obtained by the needle, as well as to some irregular masses up to a diameter of 1 cm., looking like atrophic or degenerated liver tissue. Exploration showed a large cavity without distinct walls, and as it was obviously impossible to extirpate the disease, the liver was fastened to the wall and the cavity drained. The patient died on the second day, and no autopsy could be obtained.

Examination of the tissue removed at the operation showed a tumor of endotheliomatous origin and alveolar structure, no doubt a primary

tumor. The possible relation to the injury are matters for speculation at the present time. Notwithstanding the result, I think that the case illustrates the proper method of dealing with some cases of possible liver abscess. Had the operation been done earlier, it would have been safer and might have permitted radical treatment.

In a recent case a different method was indicated.

A clerk, aged 46, was sent to the hospital with a diagnosis of liver abscess, as he had a history of diarrhea for four years, and was found by his physician to have an enlargement of the liver.

Examination showed a slight but distinct enlargement of the right lobe, with a relatively larger mass extending below the left lobe, prominent in the middle of the lobe. There was a characteristic amebic diarrhea, with blood and mucus in the stools, and in the mucus many large active amebæ containing red corpuscles. As the edge of the suspected left lobe could not be plainly felt, the nature of the enlargement was somewhat uncertain. At my request my colleague, Dr. I. I. Lemann, kindly distended the stomach, which showed that the latter was behind the mass, which moved freely with respiration and made the swelling in the middle of the mass more prominent. The leucocytes numbered 22,000. There was slight fever; the man was distinctly cachectic. In short, the diagnosis of abscess seemed clear. Complete examination led to a different conclusion. The heart was dilated in all directions. There was a mitral systolic murmur with no evidences of insufficiency in the skin, urine, or other organs. There was also a history strongly suggesting syphilis. I therefore made a diagnosis of passive congestion in a syphilitic liver with deformity, rather than abscess or gumma. Aspiration was practiced in both lobes of the liver with negative results. Under rest in bed, 10 drop doses of tincture of digitalis, strychnine, and ipecacuanha, the enlargement steadily became smaller, and in three days could not be felt. At the same time the temperature gradually fell to normal, the leucocytes also. It might be supposed by some that there was an amebic infection of the liver aborted by the ipecacuanha, but the large size of the swelling and the rapidity of the reduction seemed to me altogether opposed to that view. Moreover, the enlargement of the heart became smaller and the murmur disappeared even before the liver tumor showed signs of diminution.

THE ETIOLOGY AND DIAGNOSIS OF CHRONIC MYOCARDITIS.

By ROBERT H. BABCOCK, M. D., of Chicago.

The etiology of this affection is considered in connection with its diagnosis, because in obscure cases it is necessary to give attention to all those factors in the antecedent history that may have a bearing on the nature of the problem before us. It is not intended in this paper to discuss the manner in which the various causative elements may work, but merely to mention such facts as are now generally accepted as capable of leading to degenerative changes in the vascular system and myocardium. They will be referred to therefore in the course of the paper rather than given separate consideration.

The changes of chronic myocarditis may occur in association with endocarditis or pericarditis, or they may form a part of a general degenerative process affecting blood-vessels, kidneys, and liver, in which event they may determine the final outcome. But, in this symposium, it is proposed to limit the term, chronic myocarditis to those cases in which the changes in the heart muscle constitute the chief, if not the sole, reason why medical aid is sought. That is, they are cases in which some cardiopathy is present, and the question arises, is there, or is there not, a degeneration of the myocardium?

It goes without saying that many instances of chronic myocarditis occur, which present such easily recognizable signs of disease as to render the diagnosis simple and easy. Examples of such abound in the aged and fall under the head of senile heart. In such cases, one scarcely needs to resort to a chest examination, to diagnose the difficulty. The symptoms of dyspnea, disordered action of the heart, and possibly also of anginal pain, together with the sclerosis of the peripheral vessels, the manifest enlargement in the area of cardiac dullness, and the weakness, impurity of the first tone at the apex, or the metallic intensification of the aortic second sound, together with a possible systolic or diastolic murmur in the aortic or mitral area or both, place the nature of the cardiac condition beyond doubt, and spell chronic myocarditis so plainly that "he who runs may read."

It is otherwise with those persons in the middle period of life who present symptoms of myocardial incompetence, yet in whom physical signs of cardiac disease are wanting or are too indefinite to be discovered easily. Such cases usually occur between the ages of 40 and 55 years or in corpulent individuals under 40 or in those of about 60 who appear much younger. The difficulty of correctly estimating such cases is so great, that many times we must content ourselves with determining

the fact of heart weakness without more than a conjectural opinion as to the existence of myocarditis. It is precisely in this class of cases that one must weigh carefully all the available data in the history that may have an etiological bearing on the question at issue.

Of first importance in this regard are acute and chronic infections, typhoid fever, diphtheria, influenza, pneumonia, articular rheumatism, scarlatina, syphilis, possibly also gonorrhea, malaria, chronic cholecystitis, chronic appendicitis, chronic infection in other structures, and diseases of the female pelvic viscera. Modern researches have shown that changes in the coats of the peripheral arteries may be detected after death from such short lived infections as typhoid fever, and hence we have no ground for assuming immunity on the part of the coronaries. Even the cure of diphtheria by the antitoxin offers no guarantee of the escape of the myocardium from some degree of parenchymatous degeneration. The pneumococcus and the bacillus of influenza are particularly prone to attack the heart, either directly, or through their toxic products; while, as all physicians know, acute rheumatism and scarlatina are very likely to display at some time in their course cardiac symptoms strongly suggestive, if not demonstrative, of myocardial invasion by the etiological factors of the acute infection. Consequently, when an individual displays symptoms suggesting possible chronic myocarditis, the history of antecedent disease should be regarded as one link in the chain of evidence, and the more frequent or severe the infections, the more important is their evidence. This is especially true of syphilis, even though treatment years before may have eradicated all stigmata of the infection. The truth of this statement is amply borne out by the result of the Wassermann test.

The etiological influence of alcohol, tobacco, undue indulgence in the pleasures of the table, excessive mental work, worry, social dissipation, neurasthenia, lack of outdoor exercise, chronic intestinal intoxication, plumbism, exophthalmic goitre, etc., must all be given due consideration, even though the exact degree of influence to be attributed to each may be a debatable subject. Personal observation over a period of twenty-five years has impressed me with the frequency with which a history of close confinement to business, especially office work, in association with heavy smoking and eating, is obtained in men of middle age who seek medical advice because of symptoms pointing to myocardial incompetence. In most of them there is a history of strenuous business activity without adequate relaxation and exercise, and in not a few of them abdominal corpulence has developed as a result of overeating and many hours of sitting at a desk day after day for years. As Hazenfeld has made well known, the intra-abdominal vessels of such workers are subjected to abnormal and prolonged strain, which leads in time to sclerosis of their coats, increased blood-pressure, augmented work on the part of the heart, and eventually to degeneration of its myocardium. Consequently, the development of cardiac symptoms in such persons is in itself presumptive evidence of

some degree of chronic myocarditis, and if the early signs of circulatory embarrassment in this class of individuals were given greater heed than they often are, we might hear less of unexpected death in persons of prominence and importance to the community and great undertakings.

The value of symptoms with regard to diagnosis and, in particular, the significance of high blood-pressure readings, have been well set forth by the previous essayist, and need no more than passing reference by me. It may be well to point out, however, by way of emphasis, that sphygmomanometric figures strictly within normal limits, and still more down toward the minimum in some of these doubtful cases, may be the result of myocardial feebleness, since the systole of the ventricle is the main element in the determination of the systolic blood-pressure. This point, therefore, should be kept in mind, especially when all other data would seem to be at variance with such readings.

Shortness of breath on exertion, except in the very obese, is of course suggestive of cardiac insufficiency, especially if its development can not be attributed to some pulmonary disease and is of increasing degree. Pain of a distinctly anginal character (when valvular disease can be excluded) is, of course, in a person past 40, an almost certain indication of chronic myocarditis with or without sclerosis of the coronary arteries, even though the results of physical examination are uncertain. The symptom which to my mind is the most difficult of interpretation as regards the state of the myocardium is arrhythmia of the pulse, especially intermittence in consequence of extrasystoles recognizable on examination of the heart. This disordered rhythm may undoubtedly be of a reflex or autotoxic origin and may yield to treatment, but it is seen so often in cases of unmistakable chronic myocarditis that its occurrence in an individual of middle age is always highly suspicious of degeneration of some portion of the myocardium. Such cases should not be lightly dismissed with the assurance that the irregular action of the heart does not mean disease of the muscle.

Coming now to physical examination, the first thing to be investigated is the state of the accessible arteries. Whereas sclerosis of the radials, brachiales, temporals, dorsales pedis, etc., does not of necessity indicate the condition of the aorta, yet stiffness of the peripheral vessels, when associated with other suggestive data, furnishes strong evidence in favor of sclerosis of the aorta and chronic myocarditis. The pulse rate, and particularly its response to physical effort and change of position, are highly important phenomena and should be carefully investigated. A rapid pulse is, of course, very common when a patient submits to examination of the heart, and often is due purely to apprehension; and, when this nervousness is uncontrollable, may render a proper estimation of the behavior of the pulse extremely difficult. Nevertheless, in doubtful cases the reaction of the heart should be studied, preferably in one or both of the following ways; namely, by Graupner's *Erholung* test and

Schapiro's test of the fall in pulse rate on assumption of the recumbent position.

Normally, the number of pulse beats to the minute is from seven to fifteen less in the recumbent than in the erect posture, but when the myocardium becomes incompetent, this difference tends to disappear, so that seriously weakened hearts may beat as rapidly in the dorsal decubitus as in the upright position. In individuals showing great acceleration of the pulse from pure nervousness this normal difference in the rate may fail, and then recourse must be had to Graupner's test, although in my experience even this is not quite satisfactory and conclusive in greatly excited persons. It may be necessary therefore to re-examine such individuals on subsequent occasions.

Graupner's test is based on the physiological fact that a given amount of exercise, such as running up a flight of stairs or hopping about the office, causes both acceleration of the pulse and increase of blood-pressure, but the latter does not appear coincidently with the former or, if it rises at first, it then falls, to undergo a second rise, after the normal pulse-rate has been reached, to a greater height than before the exercise was performed. It is this secondary ascent, therefore, and not its primary rise, which indicates good heart power, since a not too seriously impaired myocardium may show increase of blood-pressure immediately after exercise, after which, with slowing of the pulse, systolic pressure declines more or less rapidly until it falls to, or even below, its original level. The sphygmomanometer is required for the accurate determination of this reaction to physical effort, but a careful observer may gain a tolerably trustworthy notion of heart power by palpation of the apex beat and pulse before and after exercise over a period of from 5 to 10 minutes. Directly following the physical exertion the apex impulse should be perceived to be considerably stronger than before; and a number of minutes later, when the apex-beat has lost appreciably in force and the heart's rate has returned to normal, the tension of the pulse should be found to increase. In seriously weakened hearts, on the contrary, exercise to which the myocardium is not equal causes a fall in systolic pressure and appreciable weakening of the pulse quite at variance with the acceleration of its rate. In cases, therefore, which reveal no positive physical signs on examination by percussion and auscultation, the foregoing tests may yield valuable information.

Of course this or any other indication of cardiac incompetence is not a proof of degeneration of the myocardium; yet, in a person whose age or history suggests the likelihood of myocarditis, such evidence of muscular inadequacy greatly strengthens the correctness of such a diagnosis.

As regards the examination of the heart and blood vessels I shall confine my remarks to the ordinary methods of such investigation, since, however much may be said in respect to the value of orthodiagraphy and the use of the Roentgen ray, these are not available for the general practitioner and in most cases diagnosis is possible without them.

Inspection should not be neglected, but ordinarily the information thus derived is subordinate to the results of percussion and auscultation. The arcus senilis, visible congestion of the superficial capillaries and veins, acceleration of respiration, etc., all convey valuable information to the careful observer, but, in those individuals falling under the doubtful class, such signs are generally conspicuous by their absence. It is most necessary, however, to scrutinize as well as to palpate the chest carefully, especially after exercise, with a view to ascertaining the situation of the apex beat, since it may confirm or correct the results of percussion. Should the impulse of the apex be detected too far to the left, it of course suggests enlargement of the heart from either hypertrophy or dilatation, and this in a person of middle age points strongly to chronic myocarditis.

Percussion is of great importance and should be practiced with great precision. Increase in the area of superficial cardiac dullness is not always present, even when the heart is enlarged, and in my opinion, therefore, is subordinate to the determination of deep-seated dullness. No doubt instances occur of chronic myocarditis without appreciable increase of præcordial dullness, but, in the majority of cases, it is found that the area of relative cardiac dullness is increased transversely, and not infrequently presents a somewhat squarish outline, owing to extension of dullness upward over the left auricle as well as over the left ventricle. When ordinary plessimetric percussion leaves one in doubt, information may be obtained from auscultatory or palpatory percussion. In many women satisfactory determination of the size of the heart is impossible by percussion, and information must be derived from *x-ray* examination; or one may form one's opinion of the state of the organ by those other means of investigation open to him.

Without question no one method of investigation is so valuable as auscultation, but, to obtain all the information which may thus be yielded, the physician must recognize something more than murmurs or impurities of tone. He must study each sound with the view to estimating its intensity and volume, its accentuation or diminution as compared with other heart tones; and, to be able to judge of significant although slight alterations, the physician must be familiar with the normal qualities of the various sounds and the mechanism of their production.

In most cases, probably, the most striking and significant changes are to be perceived in studying the two aortic tones. The first sound in the aortic area may be unchanged, enfeebled, or accompanied by a murmur, while the second sound may be intensified or weakened. A systolic aortic bruit may be due to the blood state, but, in a person of middle age, particularly a man, is strong evidence in favor of sclerosis of the aorta, and if this is followed by a loud, metallic or clanging second tone but little or no doubt should be entertained. Should these findings be associated with stiff peripheral arteries and high blood-pressure, the conclusion is warranted that the myocardium has suffered more or less damage. When

in addition there are subjective or objective signs of muscular incompetence, the diagnosis of chronic myocarditis may be made.

At the apex the sounds are also likely to furnish significant information. If the myocardium is weakened, the muscular element of the first tone is apt to be subordinate to the valvular quality, so that the systolic tone is high pitched and shortened and the accent falls on the second sound. When the ventricular wall is slightly stretched or the papillary muscles are the seat of degeneration, there may be a soft systolic murmur accompanying the first tone, which murmur or whiff is intensified by exercise as hopping or only then becomes audible. Such a murmur indicates muscular mitral insufficiency. This murmur is sometimes more distinct in the recumbent than in the upright position. So soon as the left ventricle begins to lose in tonicity, and hence to dilate, its amount of residual blood increases, and more or less stasis results in the left auricle and pulmonary system. This is shown by accentuation of the pulmonic second sound, and accordingly whenever in an individual of middle age this tone is louder than the aortic sound, it bespeaks congestion, secondary to either lung or heart disease. When associated with an enfeebled, high pitched first tone at the apex and symptoms of cardiac insufficiency, it should lead one to consider seriously the likelihood of myocardial degeneration.

From the foregoing it is apparent that the recognition of chronic myocarditis may be easy or must depend on the careful study of all the data at command. The age, the personal history, symptomatology, state of the pulse tension, the condition of the arterial coats, the reaction of the heart to exercise, the character of the various heart tones, the presence or absence of murmurs, all these factors must be considered and weighed before a final opinion is expressed. Even then, in some cases, the physician may be compelled to content himself at first with the recognition of myocardial inadequacy, inferring that the heart muscle is degenerated or leaving this latter question to be answered by the future progress of the case.

Recently, a lady of 60 was examined, who illustrated some of these difficulties as follows: The history contained no facts of special significance, aside from occasional attacks of epigastric pain, whose characters taken in connection with a vaguely palpable Riedel's lobe and tenderness, as well as Ewald's area of cutaneous hyperæsthesia on the right back, suggested a chronic cholecystitis. Her only symptom referable to the heart was a prolonged tachycardia following a brisk walk of about a mile and not subsiding for nearly or quite an hour, even when the lady was resting on a couch. At the time of examination the pulse rate sitting was 85 and fell only two or three points in the dorsal decubitus, while blood-pressure was 118 (broad arm band). The panniculus adiposus prevented satisfactory palpation or percussion of the præcordia, but the first tone at the apex was too weak and high pitched in comparison with the succeeding second sound, while the pulmonic second tone

was accentuated as compared with the corresponding aortic sound. In this case, therefore, the effect of exercise and the character of the heart sounds indicated an enfeebled state of the myocardium, while the only point in favor of this inadequacy being due to degeneration of the muscle was the age and the existence of a chronic gall bladder infection. Whereas some degree of chronic myocarditis seemed inferentially certain, it was not possible to assert this positively, and hence a diagnosis of myocardial incompetence was given, and the question concerning the structural integrity of the heart muscle was left to be decided by the developments of the future.

In contrast is the following case: A man of 53, weighing 210 pounds and in height but 5 feet 8¾ inches, sought advice because of shortness of breath on exertion and præcordial weight or discomfort. There was nothing in the past history of particular moment etiologically, except, possibly, the inordinate number of bigars smoked daily, but physical examination revealed a blood pressure of 200 mm. hg.; the apex impulse was palpable from the nipple line outward to a distance of 5 inches from the median line; there was a feeble mitral first sound, a markedly accented aortic second, and, in the dorsal decubitus, a soft systolic murmur with the first tone in both mitral and aortic areas. On these findings there was no difficulty in diagnosing hypertrophy with dilatation of the heart and myocardial incompetence, the underlying condition being a chronic myocarditis, in all probability, and not merely the cardiac incompetence of the obese—in other words a fatty heart. It was believed, however, that with proper management the compensatory hypertrophy might be re-established and the patient's symptoms relieved.

TREATMENT OF CHRONIC MYOCARDITIS.

By ARTHUR R. ELLIOTT, M. D., of Chicago.

Except in certain rare instances where mural heart changes persist after, or develop as a result of, an acute infective process, we may say that myocardial degeneration is a reaction phenomenon produced by some abnormal influence—some effect of unphysiologic living—to which the heart has been long subjected. Like all chronic nutritive reactions, resembling in this the sclerosis generally, it is slow in its development, covering a long period with its incipency and only declaring itself when the organ falls behind in its capacity to perform its work adequately.

Unfortunately, we rarely have the privilege of exercising supervision over cardiac degeneration during its earlier stages before functional disturbances have brought the patient to the consultation room for relief. When this stage is reached, much damage has generally been wrought by the degenerative process, and treatment must concern itself with cherishing what remains of cardiac reserve and affording relief to symptoms. The type of individual who, more than any other, develops idiopathic cardiac enlargement, is the active business or professional man who works hard with his brain but little with his body, and yet takes daily in his diet the nutritive potentials of a laborer. Such an individual, working under strain, is not apt to feel any concern regarding his health unless he is brought up with a round turn by some unmistakable call from Nature in the form of an angina pectoris, acute dyspnea, vertigo, etc. About our only opportunity to unearth these incipient cases is afforded by the examination for life insurance; and, because the signs are by no means easy of detection, many cases are doubtless overlooked. Many of these individuals have high blood pressure from the start, that sign antedating any other positive physical finding. Routine observation of the blood pressure in mature individuals will furnish valuable help in recognizing these cases early in their development, since every case of persistent high blood pressure is potentially, if not actually, a case of myocardial disease. In the presence of such a finding, or if perchance we can satisfy ourselves that myocarditis actually exists, it becomes our duty carefully to investigate the personal hygiene of the patient, his nutritive and excretory condition, to determine if possible the cause. Treatment at this stage will not tax our understanding of cardiac drug therapy, for little medication beyond what is needed to regulate elimination may be required, but there is presented to us the still more difficult task of convincing our patient of the existence of his, perhaps symptomless, organic fault, and of securing his co-operation toward a thorough investigation of his manner

of living, with the regulation of his habits necessary to place him in a position of organic equilibrium.

Into these early cases the problems of myocardial insufficiency do not enter, since the heart is doing its work well and symptoms of importance have not yet developed. Our directions, therefore, may neglect many fine details which subsequently in the case become of great importance, and instead should be concerned with emphatic insistence on certain principles of physiologic living. First, we should take up the matter of the diet. Overfeeding, relatively to the amount of work done, causes more cardiac degeneracy than any other single factor. These patients are usually of a corpulent, plethoric habit. They eat largely in excess of their needs of a rich nitrogenous fare and, as often as not, eliminate sluggishly by the bowel. "Overindulgence in food induces plethora, plethora induces corpulence," and loads the tissues with fat and the blood with nitrogenous waste which in turn weaken the heart. Patients of this type must be made to change their dietetic habits or they will pay the penalty in progressive heart failure or apoplexy. The diet principle to be emphasized is abstemiousness; it is wasting time to quibble over details when the fault is gluttony. Once convince these patients that they are eating too much, and an important point in prevention is gained. A certain percentage of these patients are not heavy eaters, but have poor digestive powers, and, even on moderate dietaries, readily become toxic. Unlike the foregoing type, these subjects require qualitative, rather than quantitative, dieting, to gain control of the nutritive problem. Alcohol, being especially lethal to the heart, should be strictly regulated or entirely forbidden. For like reason tobacco comes under the ban. Those who lead sedentary lives should be made to exercise regularly in the open air; and, to improve mental tone, golf, bicycling, horseback riding, and cross country walking, constitute measures of real physical salvation to the harrassed business or professional man. The strain of responsibility borne during these strenuous times by our business men, legislators, professional men, and officials, is truly a breaking strain, and the development of high blood pressure and cardiac enlargement marks the beginning of the end unless the stress of life is mitigated. How this shall be done, whether radically and at once, or by degrees under incessant persuasion, must be left with the physician who knows his man to decide.

Those with corpulent flabby abdomen will be much benefited by massage and Swedish movements. Constipation should be regulated. Gouty individuals should have Turkish or electric light sweat baths once or twice a week. These increase elimination and lower blood pressure and will prove especially beneficial to those addicted to alcohol and tobacco. If renal lesions are present or vascular changes are pronounced, the individual is to be warned against undue exertion and all those physical incidents that strain the heart and vessels. Cardiac tonics and vascular medication are not indicated at this period in the disease. Our attention is

to be directed, not to the heart itself, but to its protection from injurious influences.

The great majority of cases of myocarditis reach us only after symptoms of cardiac inadequacy have developed. For purposes of consideration we may divide the symptomatic period of myocarditis into the stage of hyposystole and that of asystole. By hyposystole we mean that condition of the heart wherein signs of inadequacy begin to appear, and yet in which careful treatment may succeed in restoring the organ to a good working state, capable of carrying the individual with moderate activities well into the vale of years. Asystole we may understand to mean the final span of degenerative heart life, where the end is in sight and inevitable, and all that is possible to accomplish by treatment is a little ekeing out of life—a compromise, and a poor and unenviable one at that.

The stage of hyposystole is generally ushered in by such symptoms as dyspnea, precordial pain or discomfort, palpitation, or commencing edema. These phenomena always point to debility of the myocardium, and, if neglected, lead inevitably to a dilatation, with all its serious consequences. The appearance of cardiac symptoms must always be carefully considered, to determine what has brought them about. This is a precaution too often neglected. Many practitioners consider the presence of deranged heart action as sufficient indication for the administration of cardiac tonics and they forthwith proceed to give digitalis. Valuable as this drug is, it is no panacea for heart disease, and must be used with judgment or much harm may be done. That the heart shows signs of degeneration must not blind one to the fact that symptoms may not be due primarily to myocardial causes. A given symptom may have various pathologic meanings, any of which may require a different line of treatment. A heart that may be quite capable of carrying its owner very comfortably and adequately along the level road of every day experience may become handicapped by some systemic disturbance, such as a cold or bilious attack or some physical or nervous overstrain. To whip up such a heart with digitalis is in the highest degree inadvisable when all that is needed is rest and measures to remove the cause of disturbance. A few days' rest, a light diet, and calomel, will do more to restore the heart at this stage than any amount of cardiac stimulation. Hyposystole often has its origin in the arteries. Sudden increases in blood pressure (hypertensive crises) are to blame for many of the vagaries of the irritable heart. When the heart is bending under the burden of a greatly increased peripheral resistance, how is it to be relieved by digitalis? Baths, purges, and a simple fare, with vasodilators, constitute the proper treatment at such a juncture. It is only when it becomes apparent that the fault lies primarily in the myocardium that we should resort to the employment of cardiac tonics.

Two important matters call for attention in the management of these middle stage cases, the questions of diet and of activity. The diet should be made the subject of careful investigation and instruction. What has been already intimated may here be emphasized, that the true principle

underlying the proper diet of these patients is quantitative control rather than qualitative restriction. Temperance in all things is to be constantly kept before these subjects, the amount of work required of the circulation never being permitted to surpass for any period its organic capacity. If the heart is weak the discomfort induced by digestive disturbance is more apt to be felt in the heart than in the stomach. Much of the arrhythmia palpitations and hypertensive waves result from digestive toxemias and vagus irritation. These patients are practically all dyspeptic and flatulent, and require constant vigilance to keep them within their digestive capacity. This is best accomplished by an all round reduction in food intake, rather than by dietetic fads. Balfour emphasizes three things as especially disturbing to the heart—too large a meal, too short intervals between meals, and the ingestion of food into a stomach still digesting. Strict moderation in the use of salt is to be enforced and restriction of fluids at meals is advisable in the case of dyspeptic and obese subjects. A point gained by combined salt and fluid restriction at meals is, that the patient will eat less, and that is after all what we have in view in a considerable percentage of cases.

At this stage we have generally to face seriously the important problem of regulating the patient's activities. Exercise may be made to strengthen a weak heart if judiciously employed. Regular moderate exertion helps to keep the myocardium well nourished, and a cardiac lesion may act, not as a bar, but as an indication to moderate activity. The object in view being to adjust the work to the functional capacity of the organ we should first know something of what that capacity is. The functional tests that are now more or less employed, and especially Graüper's method, may throw some light on this matter, but will in reality not carry us very far toward an accurate idea of the cardiac reserve. In the long run we shall have to depend on general principles and the character of each individual case, the temperament of the patient, and the sum total of our experience with him. Even with care on our part some unforeseen incident, such as a bilious attack, excitement, insomnia, or unusual worry, may upset all our calculations by placing the heart at a disadvantage, so that it cannot do the work demanded of it and in this way damage may result from activity that is ordinarily well borne. Myocardial tone can only be improved by avoiding every kind of overstrain. The heart rests during diastole, and this period of the cardiac cycle should not be too much shortened by overwork. Liebermeister suggests that a patient who has been ordered to exercise for the purpose of strengthening his heart and who, perhaps, does not sufficiently heed the timely subjective warnings of dyspnea and palpitation, should be enjoined to rest as soon as he finds that his pulse exceeds 90 or 100 a minute. Undoubtedly, a man who walks or plays golf with his finger on his own pulse will go slowly, but we may ask what benefit will exercise when taken in such a state of nervous apprehension confer? We have here touched on one of the most difficult problems in the care of

patients with degenerated hearts. Many a man has been virtually scared to death by having too faithfully placed before him the dangers of his situation. In the treatment of heart disease it is before all things necessary to keep the patient cheerful and free from anxiety. It is essential to gain the faithful coöperation of the patient; and, to secure this, we must impress him with the importance of the situation, without, however, sacrificing his mental tranquility by an alarmist attitude. To accomplish this may require all our tact and prudence. Exercise is permissible only when there is some degree of cardiac reserve. When palpitation and dyspnea follow exertion or when edema has developed, then exercise, even if carefully guarded, should be at least temporarily foregone, and rest with cardiac tonics should be instituted, to restore myocardial tone. It is under these circumstances that massage, medical gymnastics, and carbonic baths, produce their best effects. The policy of physical rest is not to be persisted in too long, and, as soon as it appears warrantable, exercise should be resumed under careful supervision. It is at this stage, in the presence of venous stasis or other unmistakable evidence of ventricular inadequacy, that the employment of cardiac tonics becomes necessary. Before we begin medication of this sort we should carefully observe the blood pressure. If the blood pressure is found to be high the exhibition of a vaso-dilator should be first tried, since the relaxation of the peripheral field may throw the balance in favor of the heart and thereafter, with rest and elimination, all may go well. In any event we may gain a point for, if the pressure is found to be much above the normal, we shall know that we are not to stimulate the heart without at the same time relaxing the arterioles, and we shall consequently combine with digitalis the simultaneous administration of a vaso-relaxant, such as sodium nitrite. If, on the other hand, no hypertension exists, we may proceed to cardiac stimulation with an easy mind. Ordinarily the transition from cardiac adequacy to inadequacy is a gradual process. At times it may be suddenly induced by some severe heart strain; in this event the patient complains of distressful subjective sensations and is in a condition of nervous apprehension and fatigue. Our treatment may here very well begin with the exhibition of an opiate, preferably a hypodermic injection of morphine. The benefit is often striking and is a good thing to pave the way for digitalis. In fact, a little opium now and then is an excellent thing for an irritable heart. Unless the urgency of the case demands it, it is a good plan not to begin the administration of digitalis at the first consultation, but to send the patient home to bed, giving him meanwhile a blue mass purge and a dose of nitre, together with a few drops of deodorized tincture of opium. This may put a new and more favorable aspect on the symptoms and enable one better to regulate the dose of digitalis. In the stage of hyposystole it is seldom necessary to employ large doses of digitalis. The object we have in view is to improve the nutrition of the myocardium, and so to strengthen the muscle for the more perfect discharge of its function. Moderate or tonic doses

are the only ones ordinarily required. The tonic dose of digitalis may be stated as fifteen minims of the tincture or one-half ounce of the infusion, and these doses may be safely administered every twelve hours. The effect of such moderate doses, it is true, is slow, and for a time may not appear very noticeable to either the patient or the physician, but in the end the best result possible is secured. All the benefits of digitalis action are inseparably bound up with its tonic effect, and, although great advantage sometimes accrues from the employment of much larger doses for a time, yet the persistent routine use of tonic doses secures in the end the very best results in cases susceptible of relief. Moreover, the chronic affections of the myocardium are the lesions requiring protracted digitalis treatment. Doses such as those mentioned, and administered at the interval stated, may be given indefinitely with perfect safety against the risk of accumulation. In all cases in which symptoms of myocardial insufficiency reappear after withdrawing digitalis we need feel no hesitancy in reinstituting tonic administration and no time limit need be set to its continuance. If at the beginning of drug treatment the heart is in bad shape, large doses of digitalis above the limit of physiologic safety may be required for a time to gain control. This is only when we have to contract a dilated ventricle; as soon as a response is secured a drop to tonic doses is to be made. The only other heart tonic that comes within measurable distance of digitalis is strophanthus. The essential difference between the physiologic action of the two is that the vaso-tonic effect of digitalis is lacking with strophanthus. This constitutes at once the weakness and the strength of strophanthus. The stimulation of myocardial nutrition and the valuable diuresis of digitalis depend largely on its effect on the peripheral circulation. Neither influence can be so well secured by strophanthus. It is more purely a cardiac stimulant, many times more powerful than digitalis, but it cannot compare with it as a muscle tonic. Inasmuch, however, as strophanthus does not produce vaso-constriction and raise blood pressure it serves a valuable purpose at times in cases marked by hypertension. This does not mean that it is necessarily to be preferred to digitalis even when the blood pressure is high, for it is my firm belief that digitalis may be used without regard to the degree of blood pressure, if only it be combined with the administration of a vasodilator. Strophanthus is less irritating to the stomach than digitalis, and for that reason can often be used when digitalis cannot. The superiority of digitalis over all other cardiac tonics is apt to give rise to a one drug policy in the medicinal therapy of heart disease. This is to be discouraged. All drugs will at times fail; the personal equation cannot be eliminated, and there are other excellent drugs (theobromin, sparteine, etc.) to be tried. I have already spoken of the nitrites in cases marked by high blood pressure. I revert to them now, to sound a warning against attempting by these drugs to reduce too much the element of hypertension. All that we should attempt by their employment is to control the blood pressure when it passes bounds of safety and is obviously imposing too severe a

burden on the heart or threatening arterial accidents. The nitrites play a valuable role in overcoming the dangers and sudden discomforts of the stage of hypostole. Angina pectoris, cardiac asthma, acute dyspnea, palpitations, and arrhythmias, yield more readily to these drugs than to any other emergency medication. At such times they may be used with a freedom not otherwise justifiable or safe.

In the third stage of the degenerated heart—the stage of ingravescent or progressive asystole—the heart has dilated, the valves have become insufficient, more or less general dropsy is present, and visceral stasis is pronounced. This is the extremity of functional deadlock and the prospect may appear discouraging. The extent to which such a case may be drawn out by effective treatment is often remarkable, and furnishes proof of the generous provision Nature has made for supporting the tireless action of the heart. If we are to win in a contest with the odds so heavily against us we must act with promptness and vigor. The statics of the circulation are reversed, arterial pressure falls, venous pressure rises, and tissue soakage and visceral dropsy oppose a serious bar to the blood circuit. The task we have to accomplish is to restore the balance of the circulation. In extreme cases it is impossible to accomplish this by cardiac stimulation alone. We shall have first to resort to some means to lessen the block in the peripheral and visceral fields. Venesection, catharsis, and tapping, are means to this end. It is difficult to state dogmatically the proper time and indications for resorting to venesection. The older physicians believed that blood letting was indicated in heart disease by a small intermittent pulse and coldness and lividity of the extremities. If I were to be guided solely by my own experience, these are hardly the cases I should select for venesection. Cases marked by small pulse and livid surface are ordinarily characterized by intense venous engorgement of the viscera—stasis in the splanchnic circuit. I have never seen abstraction of blood from the surface circulation do such cases more than slight temporary good. The impasse in the visceral field is not relieved thereby to any extent. In my opinion the most promising cases for phlebotomy are those with a full, tense pulse, fullness of superficial veins, cyanosis, and threatening pulmonary edema. The prompt withdrawal of from 15 to 20 ounces of blood will often work the most striking improvement in such a case and prepare the way as nothing else will for cardiac stimulation with digitalis. When the venous stasis is mainly visceral, the liver greatly enlarged, and ascites and perhaps hydrothorax are present we should do much better to resort to portal depletion by purgation. In cases marked by a small irregular pulse, a tense dropsical abdomen, with the superficial veins comparatively empty, and the patient unable to lie down owing to dyspnea, it is possible to afford great relief by free watery purgation. Digitalis is often inoperative until several free watery evacuations have been secured. The object is a derivative, rather than a cathartic, one and we should not rest satisfied until several pints of fluid are daily removed from the bowel. When

the limbs are firm and tense from dropsy we may render the heart the most timely assistance by drainage of the subcutaneous tissues, either by means of Southey's tubes, or by incision under aseptic precautions. By lessening the peripheral obstruction in this way we may turn the balance in favor of the heart, and thus take the first step toward improvement. Tapping of the abdomen for ascites and of the chest for hydrothorax are indicated when accumulation is extensive enough to act as a mechanical embarrassment to circulation or organic function. Even a moderate amount of fluid in the pleural sac should be aspirated. This is a point that should not be neglected.

One or other of the foregoing measures may be necessary to relieve the mechanical obstruction in the way of the heart before digitalis or other cardiac stimulant can be given with benefit. Much freer digitalis administration is needed, to gain control at this stage, than formerly. We are urged to employ digitalis and strophanthus intravenously at this point. I have never seen any particular advantage accrue from that method of administration, and I believe that it is not devoid of risk from thrombosis or embolism. With strophanthin, recently much praised, I have had no experience. Nitrites are of absolutely no avail during the stage of dropsy. Salt and fluid restriction should be enforced as much as possible.

Sometimes improvement will progress to a certain point and there end. This usually signifies that we have reached the end of the heart's recuperative power and marks the limit of our success in that particular case. Change of treatment should be tried, and it may be of the greatest service to drain even a moderate subcutaneous dropsy or ascites at this juncture.

VACCINATION OF INFANTS AND YOUNG CHILDREN.

By J. ROSS SNYDER, M. D., of Birmingham, Ala.

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Even to this day, although the protective power of vaccination has been proved time and time again, and although the virus now put on the market is manufactured with scrupulous care, most of it under government supervision, a great deal of prejudice and superstition still surrounds this simple but scourge-checking agency. These prejudices and superstitions are not cherished by lowly and ignorant negroes alone. Many white people of refinement and education (in most matters) are half or even wholly sceptical on the subject of vaccination. Many still question its protective value. Many regard this simplest of operations with fear and its effects with misgiving. Even some physicians have ideas about vaccination that are, to say the least, shady.

During a rather alarming outbreak of smallpox a few years ago, a number of parents, putting forth the most absurd pleas, applied to me for certificates to exempt their children from vaccination. One mother, recently moved into the community, told me that her former physician had cautioned her never to permit her little girl to be vaccinated, because the latter "had fits and it ran in the family to have bad arms from vaccination." Some wanted exemption for their babies because they were *teething*; some, because their children were too young (this last plea was made for children some of whom were eight years old!); one because the baby had a harelip. One young matron of culture and social position asked for an exemption certificate for her baby on the ground that everything "settled on his chest." Not all these people, perhaps, were honest in giving their reasons for not wishing to have their children vaccinated, but at least the fear of vaccination was honest and apparent. When I refused, these parents applied to others, and in the end were successful in securing the desired certificates.

It is a sad commentary on our professional standards that these groundless fears should thus be encouraged by some doctors.

Living in a section of the country where smallpox, since the Spanish-American War, has been endemic and occasionally epidemic, it has been my privilege to witness the results of several vaccination crusades, personally to vaccinate a large number of persons, mostly infants and young children, and to reach from personal experience certain conclusions as to the indications, contraindications, and the technique of vaccination. I have not at hand exact statistics on the number of vaccinations done in

this district (Jefferson County) since 1899, but three-quarters of a million is, I believe a conservative estimate. In the months of March and April of this year, 60,000 people were vaccinated in the county.

In a series of 60,000 cases of accidental pin scratches, there would, no doubt, occur several cases of septicemia severe enough to cause amputation and even death. In this community, there has never been an amputation made necessary or a death resulting from vaccination.

Vaccination then, is a much safer thing than a pin scratch.

No matter how vigilant the health authorities in a community may be in apprehending and isolating smallpox cases, if the disease should appear in a community at several points at once, general compulsory vaccination should be instituted without delay. Isolation before exposure of others is of very uncertain accomplishment. General vaccination, even without isolation of cases, would prove effectual in checking the spread of smallpox. I am inclined to believe that during threatened and real smallpox epidemics, health authorities have, by the isolation of cases, given to a large proportion of laymen a sense of security that has exaggerated their reluctance to vaccination and has provoked attempts at evasion. I believe that the sooner we abandon isolation hospitals for smallpox, the sooner will universal vaccination be accomplished. When the latter is accomplished, there will be no smallpox.

Provided no contraindication exists, and contraindications are rarely ever present, every baby before the sixth month is passed should be vaccinated by the family physician, who should be required to file a certificate of vaccination with the properly constituted authorities. This should be made a law in every state.

Young nurslings and thriving artificially fed infants undergo the various stages of vaccination with remarkably slight inconvenience. Disturbances in these from vaccination are so slight as to be almost unnoticeable. Many infants do not have fever and do not during vaccinia show any digression by loss of sleep, spirits, or appetite, from the normal.

No dread of the simple operation exists in the young infant's mind. As a rule, it submits without protest to the gentle scratching of the experienced operator. Pain is somewhat relative, and for one in whom no fear of pain exists, vaccination can be done painlessly. However, when the vaccinator is dealing with a rebellious subject, he cannot have absolute control over the niceties of his technique, and more or less pain is unavoidable.

The vast majority of infants that I have vaccinated, have gone through the operation without a whimper. Many of them have even regarded the thing as a piece of entertainment and have uttered appreciative coos and gurgles of delight. It is more often possible properly to vaccinate young infants than it is so to vaccinate grown men and women. During vaccination, in which not a drop of blood appeared in the wound, two robust looking men have fainted in my own practice. Hysterical antics by women are frequently exhibited under like circumstances. The young infant

is least apt to suffer trauma or infection. It is very unusual at this age to scratch or in any way interfere with the vaccination.

From a cosmetic standpoint it is desirable to have vaccination done in early infancy. If properly done at this age, the scar is almost unnoticeable when the child has reached its sixth or seventh year. The child will be absolutely protected from smallpox during the intervening period, many of them for much longer periods.

Too many doctors still judge the success of a vaccination by the degree of inflammation produced and by the distinctiveness (ugliness) of the scar. The character of the remaining scar, so far as I am able to observe, is entirely untrustworthy in determining the amount of protection the possessor may have. I have vaccinated a number of infants in whom only the faintest scar could be made out when they had reached their seventh year, yet in whom repeated attempts at re-vaccination at the later age produced no reaction whatever.

I have seen huge, disfigured scars, regarded by their possessors as protectors for life, which did not protect at all, but which were in reality due to infections of a different nature from cow pox virus. I have known a well-pitted scar that is regarded in the adult as characteristic of a "good take" to be due to a burn from a live coal. A negress in this city, who was very averse to submitting to vaccination, produced such a scar by a self-inflicted burn. For a number of years, she successfully deceived inspectors. These facts she confessed to me and verified them by the testimony of her mistress, whom I regard as absolutely trustworthy.

The success of a vaccination can be determined only by watching the developments in the wound on which the virus has been implanted. A primary vaccination sore must, in order to be considered a "good take," pass through the following stages: papule, vesicle, pustule, scab, and scar. In young infants the scar need not be permanent. If the sore does not pass through these several stages in revaccination, the "take" is not always to be regarded as unsuccessful. I have observed a large number of revaccinations in children carefully; in many instances, I have discovered in vaccinations that would ordinarily be regarded as not taking, slight but distinct reactions that to me were significant.

Lately I have reached the conclusion that, although it may not be necessary for protection against smallpox, it would be a great advantage over our present methods if it became customary to vaccinate in early infancy and thereafter to revaccinate at bi-annual intervals. By this frequent re-application of the cowpox virus we can so modify the "take" that there will be no inconvenience or suffering and no disfiguring scars.

The technique of vaccination is simple but careful attention to it is essential for the best results.

In an infant it makes no difference as to which arm is selected. Never should a vaccination be done on the thigh or leg. In these localities there is greater danger of infection and greater possibility of traumatic sever-

ity. The site of election is on the external surface of the arm just off the deltoid muscle, which can be easily traced, even in infants. After cleansing the surface of the arm with alcohol and allowing sufficient time for complete evaporation, then, with the internal surface of the arm lying in the palm of the operator's left hand, the external surface is put on slight tension by compressing the arm between the tips of the fingers and the cushion of the hand. By deft strokings with the fine point of a sterile needle held in the fingers of the right hand, the inoculation site is denuded of the superficial epidermis. It is desirable to draw no blood, but only serum. The entire area of the wound should exceed by but little that of the head of a moderate-sized pin. The virus is next placed on the wound and, with the left hand still grasping the patient's arm firmly, the sharp point of a second sterile needle is several times quickly but not deeply, pricked through the serum into the wound with the fingers of the right hand.

After waiting five minutes, the superfluous virus should be wiped off with sterile gauze. In another two minutes, the sleeve, if clean, may be lowered with impunity.

Vaccination shields are never necessary in young infants. The various celluloid shields on the market cannot be kept in place on an infant's arm; they slide back and forth over the arm and almost invariably produce injury to the vaccination. Shields intensify itching, keep the parts hot, are not kept clean, harbor infection, and are, especially in the young, altogether undesirable.

Extemporized shields of sterile gauze and adhesive strips are a big improvement over marketed products, but by them a child's attention is very often attracted to an otherwise unnoticed condition. Since I have abandoned shields my results have been very much more satisfactory, and I could not now be persuaded to use a shield, even on an adult, except when the latter's occupation is of such a nature as to render his vaccination, unshielded, almost certain of contamination or of injury.

THE CAUSE AND CURE OF INGUINAL HERNIA IN MAN.

By HENRY O. MARCY, A. M., M. D., LL.D., of Boston.

Although it seems a simple fact to the anatomist, that the inguinal canal traverses the abdominal wall in an oblique direction; yet, when viewed from the surgical standpoint, almost no reference will be found to the necessity or importance of the restoration of this canal to its former obliquity.

The earliest of the great writers on hernia, who, in an imperfect way, recognized the anatomical deviation from the normal, was Cloquet, of Paris.

This industrious student made five hundred dissections of the inguinal tract, with a careful tabulation of his observations, only to arrive at the important fact that in a certain percentage of the cases, in which hernia did not exist, there was a depression of the lower border of the inguinal ring, with a more or less pronounced bulging outward of the peritoneum. This he called the infundibular process and described it as a normal condition.

Even now it is asserted by some surgeons, that this condition is normal and that it can be demonstrated in strong healthy subjects with a firmly closed inguinal canal. In abdominal sections in men it is easy to show that the peritoneum smoothly covers the vas deferens and its vessels, as they emerge from the abdominal cavity; and that the internal ring is not marked by a depression of it. When tension is made on the cord, depression is apparent, as would be expected, since the relationship of the parts necessarily admits of a certain amount of mobility. This, however, is not that which Cloquet emphasized, showing, as figured and described, a real process of the peritoneum with the lower border of the internal ring much depressed—an incomplete closure of the canal.

This is owing to a lack of the developmental processes which normally should close the internal ring and prevent a depression, which, once established, may cause the intra-abdominal pressure greatly to increase it; forming in fact the initiating of hernia. For many years I have sought every opportunity for a correction or confirmation of this statement.

When we consider the developmental processes of intra-uterine life, we may almost wonder that men are not much more often subject to hernia.

In the later period of intra-uterine development, the withdrawal of the testicle from the abdominal cavity and the depositing of it externally, would almost seem like a change of mind on the part of Dame Nature. To do this in such a way as fully to close the abdominal opening and yet leave a canal free of pressure for the vessels of the cord is a most remarkable adaptation of a kind of valvular process which Nature utilizes with

similar effect only in the entrance of the ureters into the bladder and of the hepatic and pancreatic ducts into the intestine.

In my very early boyhood, our little team of the country school was playing foot ball. Our ball was a well distended bullock's bladder. A very earnest discussion arose, when we inflated it and tied the large opening, as to how, since it did not leak air, it was possible for the urine to enter the bladder. Naturally there were as many opinions as boys. I surreptitiously obtained a gun, shot a squirrel in our orchard, gathered the boys together, and with knife, scissors, and knitting needle, demonstrated that the smaller canal from the kidney penetrated the bladder wall so obliquely that the fuller the bladder, the more firmly was the passage into it closed. This was my first anatomical lecture.

As an investigator, I never forgot it, and when I began my studies and dissections on hernia I found that a somewhat similar condition obtained in the normal development and function of the inguinal canal. Did space permit, from this standpoint, I would review the history of the various operations of the centuries, undertaken and described for the cure of hernia. For a long period it was dealt with successfully by castration, which permitted a permanent closure of the canal; although in the days when all wounds were made only with intense suffering, and were, as a rule, infected, healing only after a prolonged suppuration, this operation became so common that it was stopped only by a severe royal edict, decreeing punishment for the surgeon who dared to operate.

The surgeon of to-day can have no just comprehension of the well-based fear which, until within a generation, dominated all operators with regard to the opening of the abdomen. Hence arose the establishment of operations in great variety for the occluding of the inguinal canal without dissection of the deeper structures.

Sir Astley Cooper's monumental labors will remain as a legacy of great permanent value; the reproduction of his dissections by the first artists of his time is a marvel of art. For this reproduction alone, he paid twenty-five thousand dollars; each plate reproducing the parts from actual measurement in their normal size and in pathologic conditions. Although he describes in detail the structures that enter into the normal construction of the canal and even states that he has seen the muscular fibres of the transversus surrounding the internal ring, making, as it were, an opening through it, he nowhere refers to Nature's wonderful construction of the valve-like character of the canal and its oblique penetration through the abdominal wall. His success in the operation for strangulated hernia was phenomenal for his time, and yet, singular as it may seem, he never attempted to reconstruct the posterior wall of the inguinal canal. It is easily demonstrable that, in its normal condition, the intra-abdominal pressure is distributed at right angles to the long axis of the canal, firmly closing it, as the distended bladder does the ureter. To me it has been an interesting study to examine athletes, in the demonstration of the remarkable use and strength of the abdominal muscles.

The first cause of inguinal hernia in the male is primarily the lack of a firm closure of the internal ring. This permits the formation of Cloquet's so-called infundibular process and causes the abdominal viscera to make a more or less constant, localized intra-abdominal pressure, little by little enlarging it. This is the beginning of a hernia, which may never become complete, but frequently results in the giving way of the structures when weakened by disease or age—the hernia of later life. The shape and resistance of the internal ring modifies and determines the subsequent pathologic processes. When this has given way in any considerable degree, the wedge-like shape of the omentum, with or without intestinal complication, rapidly dilates the canal, the external structures yield, and the hernia becomes more or less complete. When the fibres of the ring are sufficiently strong and the canal is of a narrow limit, I have seen the peritoneal process extending through it into the scrotum, assuming a definite shape, and of the size and length of a finger. Frequently this will be marked with different stages of progression as exhibited by constricted, reinforced rings, showing Nature's futile effort at constructive repair. A canal thus formed more commonly contains only omentum, which is compressed, fills the peritoneal process, is adherent, and acts as a plug, which may prevent intestinal complication.

THE METHOD OF CURE.

I think we are warranted in dismissing the discussion of all the various procedures, the descriptions of which fill the earlier text books and may direct our attention solely to the surgical restoration of the inguinal canal to its normal obliquity.

The limit of this article forbids reference to the technique which has been advocated in considerable variety for this purpose.

It is based necessarily on a complete dissection of the parts, the wise care of the abdominal contents, the freeing of the cord from possible adhesions and the lifting of it directly upwards. This leaves open for easy inspection the weakened, separated, and possibly imperfectly developed structures which make up the posterior wall of the canal.

The peritoneal sac is evenly sutured under tension, that it may leave no point of depression, and the redundant portion resected.

The two important primary factors of the operation consist in making and maintaining an aseptic wound and in its closure by buried absorbable sutures. The most important factor composing the posterior wall of the canal is the strong fascia of the transversus, here especially reinforced, the reconstruction of which is imperative. This may be accomplished by a variety of technique, which after all is comparatively unimportant. I first began my operations in 1870 and have used a variety of methods, of intrafolding, overlapping, etc.; as a result, I consider the simplest, easiest, most satisfactory way to be the use of a double continuous kangaroo tendon suture—the so-called cobbler's or shoe-maker's

stitch, the ends of the suture being introduced through the same opening from opposite sides. This is easily accomplished by the use of a curved needle with the eye near the point. It carries the suture through the parts penetrated, is unthreaded, then threaded with the opposite end and withdrawn, and thus the stitches are continued until the entire posterior border of the canal is firmly and evenly coapted and rejoined.

The sutures taken in this way fold the enclosed structures upon themselves in a decidedly reinforced layer. The special precaution to be taken in the suturing is, that the coapted structures shall be kept at rest with a minimum of constriction and devitalization.

It is unnecessary to state that like structures are to be rejoined, since a lack of such care is almost sure to invite failure. One may well be surprised how closely the structures forming the internal ring can be closed about the cord without injury to it. It is well to examine the tissues above the internal ring, and, if in doubt, to reinforce them by two or three continuous stitches. The cord is now replaced. The external structures forming the external wall of the canal are in like manner rejoined, and the skin itself is closed with a light subcutaneous running suture. The wound is then sealed with iodoform collodion, reinforced by a few fibres of absorbent cotton, without drainage, and if the technique has not been defective, the wound remains aseptic and primary repair will follow almost without pain or suffering. A little care should be exercised not unduly to shorten the period of convalescence, since all newly-formed structures yield easily under pressure.

Perhaps no operation in surgery gives greater satisfaction or more certain promise of permanent cure. So far as I am able to determine, quite ninety-five per cent. of my operations have been in every way satisfactory. My master, Lord Lister, when I was his pupil, ligated arteries, using cat-gut cut short, *i. e.*, buried, with impunity, but it had not occurred to him to coapt or reconstruct tissues by means of buried absorbable sutures. Born of a happy inspiration in 1870, in an emergency operation for strangulated hernia, I closed the wound with deep buried catgut sutures from a supply furnished me by Mr. Lister himself. This was followed by primary union and a permanent cure. I thought I saw at once the remarkable advantages to be obtained from their use, which then and there solved the "thousand year old problem of surgery, the cure of hernia." I have since broadened the use of absorbable sutures to every operation known in surgery. Carefully selected kangaroo tendon makes by far the best suture material yet found, and I consider the buried absorbable animal suture, in its general application, my best contribution to surgery.

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FULGURATION, AND ITS RESULTS COMPARED WITH
THOSE OF OTHER METHODS OF CANCER THERAPY

By DR. DE KEATING-HART, of Paris.

The therapeutics of cancer has passed in less than a century through three successive stages: the first, that in which caustics in general, but especially the derivatives of arsenic, reigned supreme, and which may be called the period of chemical agents; the second, even yet flourishing though menaced to-day, has belonged almost entirely to surgery; and finally, the third, born only recently, which, although burdened up to now with hasty hopes followed by disillusionment, is yet rich in incontestable successes in the present and in promise for the future—I refer to the period of physical agencies.

We must not too greatly depreciate the chemical caustics, of which Czerny was one of the most authoritative advocates; they have given most interesting results, perhaps somewhat too much forgotten to-day. But notwithstanding that nearly all superficial cancers may be benefited by their use, their toxicity, the pain provoked by their application, as well as the time required for the dispersion of the neoplasm, have rendered them remedies of but slight utility, difficult of management, and sometimes dangerous in employment.

The early epochs of surgery had given scarcely anything but failures when antiseptis, and subsequently asepsis, by rendering justifiable more audacious and extensive operative intervention, permitted us to look for the best results. If even to-day we are far from having realized therein a satisfactory therapy, it cannot be denied that a considerable proportion of durable successes has been due to surgical removal, and that, even if we must except neoplasms of the tongue, operable cancers of the breast and the uterus at least owe to it a certain number of cures already of long standing.

The discovery of the action of the *x*-rays on living tissues, healthy or pathologic, for a time gave rise to the hope that the specific treatment of cancer had been found; but though some excellent results have occurred to confirm our hopes, the great majority of failures, of recurrences, and also of aggravations, that this therapy very quickly encountered, soon caused with respect to it a possibly exaggerated disenchantment. The facility with which radium can be introduced into the very interior of the lesions, has given a fresh impetus for radiotherapy; and some interesting successes—as yet hardly of long standing, few in number and limited to certain kinds of cancer—augur a better future for radium than for the Crookes' tubes. On one account, however, there is reason to fear

lest the same causes should lead in course of time to failures of the same order.

Let me explain: The Roentgen rays destroy all living cells, possibly neoplastic cells more particularly than others; but they destroy only those cells that they have attacked with sufficient energy, leaving to their neighbors a vitality at least equal, *often superior, to that formerly enjoyed by these cells*, and not seldom the latter appear to multiply subsequently with greater intensity after radiation than before it. The rays, then, leave at least undiminished, when they do not augment it, the disease that they do not destroy. After observing the retrogression of tumors under this treatment, we are constantly in dread of their reappearance, and experience has shown that, as regards the rays of the tube at least, the disease is infinitely more rebellious after recurrence than before the treatment; so much so, that the struggle rapidly becomes unequal and terminates sooner or later in a failure for radiotherapy.

As a matter of fact, the point to be attained in reference to every infectious malady is, not so much the direct destruction of the lesion, as the modification of the soil in which it develops, thus rendering it unfitted as a culture for the virus, whatever may be the nature of the latter.

That is the ideal realized by therapeutic serums and vaccines. While awaiting the, as yet hypothetical, happy discovery of an efficacious anti-neoplastic serum, we may rightly look for important successes from every treatment having for its object, not so much the destruction of the infecting cell, as the rendering of the organism, or of that portion of the organ in which the cell is implanted, unsuitable for its propagation.

Such appears to be the effect of fulguration, and such is the explanation that it seems natural to give to the numerous good results that are already due to it.

I shall not revert to the details of description already so often repeated. Let it suffice to recall that this method consists in an electro-surgical operation divided into two stages. The first stage consists of the operative removal of the tumor, practiced, if not extensively (when that is impossible), at least to the limit of the apparent boundaries of the disease, and including therein metastases and infected glands. Then, in the second stage, long and powerful sparkings of great frequency and high tension are applied to the wound thus made.¹

Without dwelling on the mode of operation and the immediate results described elsewhere, I will say at once how this method, of which I first spoke four years ago, seems to act, not on the neoplasm, but on the soil in which it grows, and I will then show the importance of the results already given by it by comparing them with those of other therapeutic measures in the highest repute.

But first I must prove that it is really to the sparking, and not to the surgical measures, that the good results produced are due.

¹Keating-Hart. La Fulguration dans le traitement du Cancer, *Archiv. d'Electr. Méd.*, No. 238, 25 mai, 1908.

Here are the three categories of facts on which I shall rely to demonstrate it:

1. The sparking, when employed without or with inadequate surgical operation, gives undeniable results, insufficient doubtless, but already very definite.

2. The tumor is in no way modified in its appearance or in its vitality, from which we may, with some reason, conclude that it is not the tumor itself, but the conditions of its nutrition,—that is to say, the environment in which it develops—that is transformed.

3. Laboratory experiments and clinical observations give us a plausible explanations of these facts.

1. *Action of the current without excision.*—My earlier attempts enable me to appraise this procedure. Starting from a principle, which, however, I have since recognized as false, I sought at first to produce by means of the electric discharge, not an immediate and direct destruction of the tumor, as many have thought, but what I called its “sideration,” and that is, indeed, the name that I at first gave to my method. I understood thereby a sort of stunning of the cancer cell, in consequence of which the latter, being diminished in vitality, must retrograde little by little, and, from a condition of anarchy, return to a condition of organized and orderly control.

The results seemed to prove me right. The first case that I treated in this manner was very remarkable in this respect. It was a case of cancer of the breast, “*en cuirasse*,” recurring rapidly after a primary surgical intervention. The nerve sections had caused anesthesia of the cutaneous surface, which allowed me to apply violent sparkings many times a week to the affected region without chloroforming the patient and without giving rise in her to any intolerable pain. Under the influence of this treatment, the general condition improved very quickly, whilst locally the tumor adherent to the thorax but *extended especially superficially* (a fact that is very important) retrograded under one’s eyes; the deep metastases (pulmonary and other) alone seemed uninfluenced. This observation has since been multiplied a great number of times under different forms, but only when the lesions were not deep, that is to say, when *the healthy plane subjacent to the tumor was not more than two or three centimeters removed from the surface on which I was operating*.

I have published in a recent work² a series of observations of the same kind, in which, in spite of the persistence of cancerous nodules in fulgurated wounds and their environment, I obtained, after the application of my method, excellent and durable retrogressions, more or less complete, notwithstanding that previously the lesions were developing with rapidity, and although the surgical intervention had resulted rather in aggravating than in diminishing it.

The current, if employed alone, or accompanied by inadequate surgical

²Keating-Hart. *La Fulguration et ses résultats dans le Traitement du Cancer, d’après une statistique personnelle de 247 cas.* (Maloine, Editeur, Paris, 1909.)

intervention, gives, then, very remarkable results in cancer; consequently it is clearly that which is the active element in my method. But upon what tissue does it act? On the unhealthy tissue, by destroying it or weakening it? Or on the healthy adjacent tissue, by modifying it? And in this latter case, in what does this modification consist?

2. *The sparking modifies the area underlying the tumor.*—A previous fact had helped to shake my hypothesis of the direct "sideration" of the cancer cell: I had seen³ cutaneous neoplastic nodules retrograde around a fulgurated region without themselves being touched by the discharge. A very simple experiment completed the destruction of my first hypothesis. Mice cancers, when fulgurated, then removed and re-implanted in healthy mice, developed afresh under conditions identical with those of grafts that had not been exposed to the spark; the *neoplastic cell (not destroyed directly by the electric discharge) was then in no way attacked by it as regarded its vitality*. As to the destruction itself, the researches of Maute, in the service of Associate-Professor Tuffier at the Hôpital Baujon, have demonstrated that it is very superficial (one or two millimeters in thickness).⁴ It was necessary, then, to reject completely the hypothesis of any notable modification of the neoplasm, whether physiologic or histologic, by the high tension current. The evolution of the cancer being, however, indisputably diminished by it, as I have shown above, it could only be that the organism sustaining the lesion had been rendered less fit for its growth. This was the logical conclusion, but it remained to determine the quality of these modifications.

The first hypothesis that our actual knowledge of the reactions of the organisms suggested, was that of a fibrotic defense; it might be supposed that after fulguration the cancerous elements were compelled to retrograde, being strangled between the meshes of a dense and abundant connective tissue. This explanation, advanced by Juge, has been supported by Zimmern. It cannot stand, however, in face of the two following objections:

(a) The retrogression of the nodules often takes place *outside the wound* and in nodules *neither fulgurated nor ulcerated*, in which, consequently, fibrogenesis can have no part.

(b) The fibrotic element, far from being a demonstrated cause in the cure of cancer, seems in many cases to provoke its appearance, as, for instance, in the neoplastic degenerations determined by old cicatrices from burns.

A second explanation of a similar physiologic order appeared to be more plausible. It called for the admission that the sparking modified the local trophism in such a way that the tumor, being badly nourished, tended consequently to retrograde. That is the view that I maintained at the Congress of Physiotherapy at Paris, in 1909, and afterwards at Lille (August, 1909, Congress for the Advancement of Science) without other

³Idem. Les effets palliatifs de la Fulguration (pp. 20-27).

⁴Tuffier, Soc. de chirurgie. Paris, 26 avril. 1909.

proofs at first than the analogy with some facts observed by me. Here are these facts. (Although I have already spoken of them elsewhere, they appear to me sufficiently important to be repeated here):

(c) *Facts and experiments which confirm the hypothesis of an action on the subjacent healthy tissue.* The employment of the high frequency short current (from one to four centimeters), that is to say, at a relatively low tension, produces the effect of cellular excitation; it provokes a rapid cicatrization of wounds, and its remarkable action on the closure of torpid ulcers is too well known to require any insistence on it.⁵

On the other hand, the high tension current properly so-called, of a minimum length of seven centimeters, and applied for a time sufficiently long in proportion to the surface fulgurated, *so far from activating cicatrization, retards it to the point of transforming into a torpid wound a loss of substance of normal quality.* It fills up, then contracts by retraction of the surrounding healthy tissue. But it becomes hardly at all covered with epithelium. There is, in other words, a natural autoplasty, not cicatrization, and if the surrounding skin is but slightly extensible, the closing of the wound, far from being hastened, becomes extremely slow. By analogy, then, and considering the difficulty of the re-formation of healthy epidermis after fulguration, I had to admit that the same trophic phenomenon that prevented such re-formation retarded or suppressed the propagation (*repullulation*) of cancer *in situ*. New and very interesting experiments, previously unknown to me, have come to support, by histological examinations, my somewhat unsupported hypothesis. I refer to the researches of Prof. Ghilarducci, of Rome.

On June 30, 1909, Ghilarducci presented to the Royal Academy of Medicine of Rome a communication in which he made known his researches on "the biologic and curative action of fulguration." He says: "The curative value of fulguration in malignant tumors is still the subject of much discussion. The method of Keating-Hart has both ardent partisans and strong opponents. I have treated by fulguration 11 almost inoperable cases; namely, 3 epitheliomas of the breast, 2 of the neck, 1 of the nose and the antrum of Highmore, 1 of the concha of the ear extending to the mastoid apophysis, 2 carcinomas of the cervix uteri, and 1 carcinoma of the nasal septum. * * *"

"The patients belonged to the services of Professors Allesandri, Ferreri, and Ferreti. The results, immediate and near, *have been good in those cases in which surgical excision could be practiced in such a way as to comprise the macroscopic limits of the tumor.* I cannot express an opinion on the definitive results, my experience being yet too recent."

But having observed the constancy of all the trophic reactions of the current published up to that time, and rightly admitting that all trophism is normally regulated by the nervous centres, he has sought the causes of these phenomena in the modifications of the nerves and of the spinal

⁵Zimmern. *La Valeur Thérapeutique de la Fulguration.* Paris, 1909.

cord consequent on fulguration. With this point in view, he has made a series of experiments on rabbits: Exposing the animal's sciatic nerve, he submitted it to the current for a period the duration of which varied from a second to half a minute. Then from day to day he examined microscopically the histologic results of these fulgurations. His work in *extenso* gives his observations in detail, which are too long to be recounted here; I shall content myself with a résumé of the principal conclusions as follows:

1. The action of the current bears a relation to the intensity and duration of the fulguration.

2. *It manifests itself to a considerable distance from the point fulgurated.* In his experiments, Ghilarducci has discovered in the cord, *sacral and cervical, even when not itself fulgurated, lesions corresponding to those that he had produced on the sciatic nerve subjected to the current, and that without modification of the intermediary nerve trunks or of the spinal ganglions*, as though the nerves transmitted in its integrity the electric shock to the medullary cells without themselves suffering any consequences therefrom.

3. Finally, *the distant medullary lesions may vary from a simple chromatolytic reaction to a cellular necrosis*, according to the intensity and the duration of application of the current to the sciatic, and the lesions are bilateral.

We know what profound troubles of nutrition may be brought about by the destruction of certain medullary segments and the retardation of growth that the limb of a child undergoes after an attack of anterior poliomyelitis. Is it not easily admissible that the modifications transmitted to the spinal cord by all the nerve terminals of a wound submitted to fulguration, should determine in it reactions that manifest themselves by a certain cellular destruction followed by a more or less complete repair? And would not that explain and justify, to use Ghilarducci's words, "the analgesias and trophic troubles clinically displayed?"

To sum up, I believe that I have shown that the action of the high tension current employed in a *fulgurating dose* in no way resembles that of other physical agents.⁶

The retardation that it causes to the epithelial covering of wounds, the retrogression that it provokes even in cancer nodules situated around the fulgurated zones, and finally, the distant histological actions that it determines in the medullary centres corresponding to these zones, all suggest a seductive, even if yet incomplete, explanation of its success

⁶It is especially differentiated from "diathermia," studied in Austria and Germany by von Berndt, Zeyneck, Preeps and Nagelschmidt, and lately introduced into France under the name of "electro-coagulation"; this is indeed only a thermic means of destruction, not a modifier of the trophic centres. I do not discuss, but merely call attention to this method, so interesting from other view points, which up to now has not given any result that has been seriously studied in cancer, and the works of the authors themselves of the method (Berndt, Nagelschmidt) have proved that the cancer cells *not destroyed by the diathermia acquired on the contrary a heightened vitality.*

in the treatment of cancer. The ignorance in which we find ourselves regarding the exact pathogeny of these neoplasms, does not permit us to demand more from any theory. Certain experiments, however, now proceeding, will soon, I hope, permit me to support it with sufficiently forcible proofs. But the difficulty even in the matter of dosage, explains how it is that the results can be so different with different experimenters and cases.

I have explained elsewhere the errors of technique⁷ to which the published failures were due. I shall not recur to them. It will be sufficient to remark that those who have faithfully followed my technique have already published numerous successes and brilliant statistics.⁸

From these statistics, as from mine, it is clear:

1. That all kinds of cancer of the epitheliomatous, as well as of the sarcomatous type, have given good results under fulguration.

2. That in the very advanced cases (generalized disease or, if localized, inadequately susceptible of operation), important palliative effects, such as suppression of pain and hemorrhage, cicatrization, increase of strength, prolongation of life, have been manifest in more than 70 per cent. of the tumors of this class treated by my method.

As to the curative effects, they can as yet have no definitive value, inasmuch as not more than four years have elapsed in the oldest cases fulgurated. But we can judge of their probable value by comparison with results of the same standing offered by surgery in analogous cases.

(a) Cancers of the breast have given me 39.5 per cent. of successes for a mean duration of a year. The mean, after three years, in surgery is about 40 per cent. We have there no absolute term of comparison. We must wait till later for conclusions on this point.

(b) Six operable cancroïds of the mucosa, of which 2 had extended to the glands, have given me, with a mean period of seventeen months, 100 per cent. of successes. This success is too great not to belong to an exceptionally fortunate series. However, it acquires a demonstrative importance only in relation to the following:

(c) Twelve cancers of the buccal mucosa, yet operable, *although for the most part very much advanced*, have yielded to fulguration 83 per cent. of freedom from recurrence, over periods varying from 7½ months to 2 years,⁹ while in the 32 cases of the statistics of Poirier, we find 46.8 per cent. of non-recurrence for cancers, of which only a few had been operated on some years, and the great majority only some months, pre-

⁷R. Desplats, of Lille. Rapport sur la Fulguration, Congrès de l'avancement des Sciences, Lille, Aout, 1909.

P. Drevon. Fulguration et Cancer, étude sur la méthode de Keating-Hart—Librairie Maloine, Paris, rue de l'école de Médecine.

Dubois-Trepagne, of Liège. Résultats de la Fulguration à Liège—Congrès international de physiothérapie, Paris, 1910.

⁸See Keating-Hart: La Fulguration et ses résultats, etc., p. 34, et. sqq. Maloine: publisher, Paris.

⁹Drevon: loc cit., p. 62.

viously. If this comparison is accepted, it gives twice as many successes in favor of fulguration.

(d) Finally, in operable sarcomas, fulguration scores 89 per cent. of successes for a mean duration of 16 months, while the greater part were recurrences after surgery, and included osteosarcomas and melanomas.

Such are the brilliant curative results yielded by fulguration in cases usually very grave and in the majority operated on to the full extent of the lesion.

We have seen how far superior they are to those of the orthodox surgical removal, even when of wide extent. It will be more difficult to compare them with those of other physical agents used against cancer, such as x -rays, radium, and diathermia—the so-called electro-coagulation. I do not dwell on the reasons given above, that lead me to discard diathermia; the absence of demonstrated cures, its action recognized by the authors themselves of the method as dangerous, on the infiltration of the areas bordering on or those destroyed by the hyperthermic currents; they are more than sufficient to demand great reserve as to the probable effects of diathermia in cancer.

To radiotherapy we owe very beautiful and numerous successes in cancrroids of the skin, a few, much more rare, in those of the mucosæ, in lymphosarcomas and cancers of the breast, and finally almost constant failures in cancers of the mucosa. It is enough to glance at the statistics of fulguration to understand how far superior these results are to the statistics of radiotherapy. The cures due to radium are more interesting. As with the x -rays, in cancrroids of the skin as well as in a few of the mucosa, it has achieved some beautiful successes. Its most indisputable indication seems to lie in the treatment of inoperable cancers of the parotid gland. We may add that its palliative action, by permitting a more thorough application of fulguration, renders it still of utility in association with the latter. On the other hand, in the treatment of cancer of the breast, Dominici¹⁰ regards the action of radium as inferior to that even of surgery, and as inefficacious in cancers of the buccal mucosa, however slightly penetrating. We may add that most of the published results are yet too recent to permit of too great optimism for the future after the disillusionment we have experienced in regard to radiotherapy.

Without, then, denying the efficacy and utility in certain cases of the various methods of cancer therapy by physical agencies and by surgery, it seems to me that we have the right to conclude that fulguration is the method that has yielded up to date by far the best results in malignant neoplasms, and in that respect, clinical experience only confirms what laboratory researches and scientific observation seem to explain in so alluring a manner.

¹⁰Dominici. Archives générales de Médecine, Juillet, 1909.

A FURTHER REPORT UPON "A USEFUL MILD CAUSTIC;"
ITS EMPLOYMENT IN CANCER AND AF-
FECTIONS OF THE CORNEA.*

By ARTHUR E. EWING, M. D., of St. Louis.

In an article entitled "A Useful Mild Caustic; A Relief, Possibly a Cure for Some Forms of Cancer," read before the Ophthalmic Section of the St. Louis Medical Society and published in the *American Journal of Ophthalmology* for November, 1909, I mentioned a variety of instances in which a solution of ten grains of resorcin and one hundred and twenty grains of salicylic acid to the ounce in alcohol had been used for cauterizing purposes with excellent results, and among them were 3 cases of malignant epithelioma. Since then opportunity has arisen for several other trials which materially add to the data therein mentioned.

Before passing to them it may be well to state that these experiences and those that have preceded, demonstrate that the value of the solution consists in its ability to destroy, not only the malignant or infected cells, but also the avenues of the food supply to the cells, and this, too, without exciting harmful reaction in the adjoining tissues. Particularly is this so in the case of cancer, on the cells and vascular frame work of which it seems to have a selective action without injuring to any extent the healthy granulation tissue that replaces the neoplasm. Besides this it controls wholly, or to a very great degree, the well recognized "cancer odor."

The first of the cases now to be mentioned is a malignant rodent epithelioma of the upper lip and ala of the nose, with a history of twelve years' growth, during the whole of which time it has been in the care of our most scientific dermatologists, and has received every form of treatment except actual excision, excessive destructive caustics, fulguration, or the actual cautery. It began as a small wart-like growth on the right side of the upper lip. In the long course of the existence of the growth this region has become occupied by a scar, which draws the right portion of the lip upward so that the teeth are somewhat exposed. During the past year it has been in the care of Doctor F. C. Simon, under whose excellent management with a "Multum in Parvo" light and a six per cent. bismuth subnitrate in vaseline ointment a large spongy mass to the left side has decreased in size and the whole ulcer has softened at the margins and has taken on a more healthy appearance. At my request Dr. Simon kindly gave me the opportunity to make a trial with this solution in order to demonstrate how it would act elsewhere than on eyelids and orbits.

*Read before the St. Louis Ophthalmological Society, May 9, 1910.

At the time of the first application the growth consisted of four separate pearls, one on the right side of the nose, one above the angle of the mouth on the right side, one just to the outer angle of the mouth on the right side, and one to the left side of the upper lip and extending along the lip a little above the mucous margin. It was with this latter that the spongy mass, now almost worn away to the level of the surrounding tissues under the influence of the light, had existed. All ranged in size from 8 mm. to 5 by 12 mm. in diameter.

With the first application to the pearl on the nose a small vessel with its numerous branches which came over the margin of the ala and spread out on the surface of the ulcer, was turned black; in the second pearl, vessels came from the cheek; in the third, a vessel coursed along the bottom of the ulcer from the angle upward; in the fourth, a large vessel extended from the outer portion of the ulcer and branched along rather deeply under its surface. These vessels were destroyed by the first and second applications made two days apart, and their death was followed by the rapid disappearance of the purulent discharge which heretofore had been so abundant that it was necessary to wear a plaster continually and to change this several times daily. Now sufficient protection was formed by using the bismuth ointment and covering this with talcum powder. This treatment was begun ten weeks ago, and has been continued every third to fifth day over the places where ulceration has persisted. In the meantime the weaker solution, containing five grains of salicylic acid to the ounce, is applied once to twice daily to the original dressing of ointment and talcum, thus keeping the otherwise undisturbed scab thoroughly sterilized. Healing has progressed steadily and favorably. The upper three ulcers are practically well, the one at the angle of the mouth persists, but is filled with apparently healthy granulations. The patient is in her eightieth year.

In order to determine what effect this dressing would have on the "cancer odor," Dr. Carson kindly placed at my disposal four weeks ago, at the Skin and Cancer Hospital, two hopelessly infected patients. One was a woman seventy years of age, with an enormous suppurating cancer, which involved a large portion of the frontal and parietal regions, and in which the skull was bare and dry over a space of about eight square centimeters. The cancerous mass, two centimeters or more in thickness, bordering this bared surface and extending over the left eye and filling the orbit, had been injected with formaldehyde, causing extensive necrosis in the tissue. From places where there were new granulations there was also free bleeding with each disturbance of the dressings.

To the whole ulcerating surface and over the necrotic exposed bone daily applications were made freely and teased into the tissues till they became brown. This was followed by a twelve per cent. bismuth subnitrate vaseline ointment, and over this was sprinkled thickly a dry sterilized talcum powder (U. S. P. purified, Mallinckrodt), to each four ounces of which had been added eighty grains of sodium biborate,

forty grains of resorcin, four drops of oil of bergamot, and eight drops of oil of lemon. After the second dressing the odor was no greater than in any ordinary ulcer in which sequestering bone was present. Also the bleeding ceased and the whole surface assumed a more healthful appearance.

The same may be said of the second case, in which the left breast and probably the glands of the axilla had been removed seven months previous to the time when the patient, a negress, thirty-four years of age, entered the hospital. At the time of entrance the whole breast and axillary region around to the scapula was a mass of offensive fungoid cancerous tissue, which was subjected to fulguration, with the result that when it came into my hands several weeks later, there were large quantities of necrotic tissue being separated from the newly forming granulation tissue. At no time until her death, four weeks later, was there any tendency to spreading or increase in the size of the original ulcer. The cancerous odor was also materially lessened.

On the right breast of this same patient, which was a solid cancer with the epithelium unbroken, the attempt was made to see whether the absorption of the drugs through the epithelium, or through any abrasion that might be made in it, would control or lessen the tension. For this purpose the skin was burned through by means of the solution and a strong salicylic acid paste. In the course of a week a large non-suppurating ulcer six centimeters in diameter was produced about the nipple without any influence on the hardened breast. Also this treatment caused considerable steady pain, much more than was produced by the far more extensive ulcer on the left side, doubtless due to the injury to the sensitive dermal nerve endings. As to the pain in general, which was always present, it was greatly relieved, except at the moment of the sting of the application; so much relieved within ten minutes after the application that the patient would sit up in a chair and say she was entirely comfortable for two or three hours. It also controlled an ever present cough to a considerable degree. Before using the solution a one per cent. cocaine solution was applied to the surface of the ulcer; this somewhat modifies the sting of the alcohol.

The following hospital and autopsy reports kindly furnished me by Dr. R. C. Findlay show how desperate these two cases were.

January 20, 1910. M. A., aged 70, enters with round lesion 3 inches across on forehead, ulcerated in center, giving "coral island" shape; three-fourths of an inch high, very foul. Clinical diagnosis, epithelioma of forehead. Metastases in parotid region. Cleaned up and bichloride pack.

January 24 to February 28. Acetone or acetone bisulphite off and on.

February 28. Injected with varying strengths formaldehyde (5% to 20%), causing much sloughing in a few days.

April 4. Resorcin salicylic acid alcohol solution.

April 17. Died. P. M. Metastases in both lungs. Fluid in each

pleural cavity. Pericardial effusion. Nephritis. Death from edema of the lungs.

February 24, 1910. M. S. Entered with left breast gone and at its site an ulcerated scar. Very foul. Clinical diagnosis. Recurrent carcinoma, breast.

February 28. Cured and fulgurated.

March 28. Fulgurated. Acetone or acetone bisulphite off and on.

April 5. Resorcin salicylic acid alcohol solution.

May 6. Died. P. M. Metastases in both lungs, liver, and supra-renal body. Left lung collapsed. Clear fluid in left pleural cavity. Bloody fluid in right pleural cavity. Nephritis. Pneumonia.

A fourth case, now being treated, is a malignant epithelioma of the hard palate, the buccal mucous membrane on either side, and extending into the floor of the anterior nares, closing each nostril with cauliflower-like growths, each containing a crater, the right protruding to the nasal orifice and the left beyond it. After the sloughing from the first application the patient could breathe through the right nostril, and after later

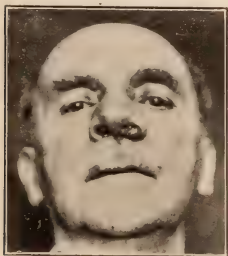


FIG. I.

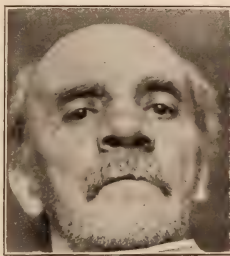


FIG. II.

ones, quite freely, and a little through the left. Also the condition in the mouth and palate improved, the applications having been made every second or third day. For a week they were discontinued and immediately the growths in the nose began to increase. With a hypodermic syringe the solution was injected into the base of the large one on the left side by three punctures. A few minutes later the patient remarked that the injected region felt numb. The following day there was not so much reaction from this procedure as would result from an ordinary hypodermic injection of morphine, although half of the growth was blue black. Two days later the bluish mass dropped away leaving a clean base free from granulations.

Since the reading of this article three other injections have been made into these growths, causing them to slough without injury to the adjoin-

ing tissues. The accompanying half-tone, Fig. 1, shows the tumor on the left side; the photograph was taken previously to the development of the tumor in the right meatus. The half-tone, Fig. 2, shows the result after the use of the solution by injection.

In the previous article I mentioned several instances of the use of this solution on the cornea. Since then three opportunities have presented themselves for trying it further in hypopyon keratitis, all of them ulcers involving more than half of the corneal area, and all of them eventually perforating. In two of them a very good cornea was saved and the third is well on the way to recovery.

My latest venture with it, undertaken at the suggestion of my assistant, Dr. J. B. McCubbin, who had used it in a similar case, was to attack an old, thickened, tough, corneal staphyloma, which protruded between the lids. For three successive days incisions were made with a sickle needle entirely across it to the depth of the corneal curvature with very little reduction in its size. I then resorted to this solution, using it daily for three days. On the fifth day the staphyloma was entirely destroyed leaving a fairly good cornea of nearly normal curvature, and this with no perceptible conjunctival reaction. Probably a small fistula exists somewhere in the destroyed area or there is a good filtrating scar. The globe is quiet, tension about normal, and the patient is comfortable.

For the exact proportions of the caustic and also of the weaker solution used for keeping the scab sterile and for the mode of their employment, the previous article may be quoted.

"The weaker or cleansing solution used in the first case has long been employed by me for seborrhea, acne, toothache, insect bites, shaving, fresh wounds and ulcers. Its proportions are:

Resorcin.	gr. xl :	grm.	2.60
Salicylic acid.	gr. xx :		1.20
Carbolic acid.	gtt. j :		.06
Oil lavender.	gtt. j :		.06
Oil lemon.	gtt. iv :		.26
Oil bergamot.	gtt. iv :		.26
Alcohol, 95%.	5 iv. :		124.40

"For cauterizing purposes this solution should be saturated with salicylic acid, which means the addition of one hundred and twenty grains, or 8.00 grammes of the salicylic acid to each ounce.

"The drugs are all well known, and all of them are used in various ways in connection with general medicine, with the exception, perhaps, of the oil of bergamot, which seems to have a place only in perfumery, and yet when it is dropped upon the tongue its anæsthetic action is quite as marked as that of the other essential oils. The anæsthesia produced by the solution is doubtless due to these oils in combination with the alcohol, the resorcin and the carbolic acid. Where it may be employed in place of

the actual cautery, or the more powerful caustics, its advantage is in this anæsthetic power, together with its safety, and its slight tendency to excite acute inflammatory reaction. Upon the cornea and conjunctiva it should be used carefully so as to not injure healthy tissue. Upon epithelial growths it will have little effect where there is much thickening of the epithelial mass, unless it is teased into the growth until the capillaries become brown or black, and this should be repeated daily or every second day until all the epithelial tissue is destroyed, and the floor and margins of the ulcer are covered with normal, healthy granulation tissue.

"When either the weaker or the stronger solution is applied to an abraded or a sensitive surface there is a sharp momentary sting, followed by a little pain, unless cocaine or some local anæsthetic has been previously used. This pain quickly subsides. Either of the solutions may then be immediately and frequently re-applied with little or no suffering to the patient. The stronger or caustic solution first causes abraded, ulcerated or mucous surfaces to turn white. If this whitened surface is teased, preferably with the weaker solution applied on a pledget of cotton and alternated occasionally with the stronger solution, the teased region will presently change from white to brown or black, when red blood is present, usually very readily in adventitious tissue, less readily in normal tissue. When used upon the cornea the immediate and subsequent action of the stronger solution closely resembles that of the actual cautery."

MEDICAL AND SURGICAL PROGRESS.

FRESH LIGHT ON NEPHRITIS AND ALLIED DISORDERS.

AN ABSTRACT OF RECENT LITERATURE.

By ALBERT E. TAUSSIG, M. D.

1. LEUCOPATHIES.—Feuillié (*Paris: G. Steinheil*, 1909).
2. LEUCOCYTIC RESISTANCE.—Achard and Feuillié (*Soc. de Biol.*, December 28, 1907).
3. HEMORRHAGIC RENAL LESIONS.—Achard and Feuillié (*Soc. de Biol.*, April 8, 1909).
4. THE LEUCOCYTES IN DISEASE.—Achard (*Sem. Méd.*, November 3, 1909).

In 1905, R. C. Cabot compared the postmortem findings with the urine analyses in a considerable number of cases of nephritis of various sorts. The results were astonishing. In a considerable proportion of the cases the antemortem and the postmortem findings seemed radically at variance. Albumin and casts were found where autopsy showed no nephritis and, conversely, normal urines were reported where histological examination showed the presence of acute or chronic nephritis. These observations have since been confirmed by other clinicians. At the time they seemed entirely subversive of many of our generally accepted notions regarding the nature of Bright's disease and clinicians have of late become much more cautious in their interpretation of urinary findings.

New light of a most interesting character has recently been thrown upon this subject by the clinical and experimental work of Achard and his pupils, chiefly E. Feuillié. The concepts on which all their work, which now extends over some seven years, is based are denominated by them leucopathy and exoleucosis. The former term is used to designate a diseased condition of the white corpuscles usually resulting in their destruction; the latter means the tendency of these pathological corpuscles to migrate en masse to one of the excretory organs, there to be disposed of. Under these hypotheses, a number of well-known pathological phenomena admit of novel explanations. Thus, the usual explanation of the presence of numerous leucocytes about the renal tubules in acute nephritis may indicate, as is usually assumed, that the latter are attracted to the spot by what is known as chemotaxis, due to the diseased condition of the kidney. An equally valid explanation, however, the truth of which these workers have endeavored to establish, is that primarily diseased leucocytes are attracted to the previously healthy kidneys, there to be excreted. The disintegrated corpuscles, excreted with the urine, cause an albuminuria, which may be entirely salutary in that it rids the body of

pathological material. On the other hand, the long continued presence of these diseased leucocytes about the tubules may secondarily result in a degeneration of the renal epithelium and so lead to the condition we know as nephritis. This point of view, so far as the kidneys are concerned, thus leads to two novel concepts, that of a salutary albuminuria, and that which considers the albuminuria as the cause rather than the result of a nephritis.

The experimental work, on which these conclusions are based, is of great interest. It consists of the hypodermic injection, into rabbits and dogs, of various substances; a solution of cantharidine in acetic ether, a solution of chromic acid, or a considerable amount of aseptic white of egg. The kidneys of the animals so treated were extirpated at varying intervals after the injection and examined histologically. In every case, often within less than half an hour after the injection, the kidney showed a marked interstitial infiltration with leucocytes, sometimes so great as to form real gummata and sometimes almost obliterating the kidney parenchyma. In the milder cases, the leucocytes could be seen lying about the tubules. These they did not invade, but penetrated into the lumen of the glomeruli and underwent disintegration there. Usually the tubular epithelium showed evidence of degeneration, but in the earliest stages no evidence of this degeneration could be seen. It thus appears that while the same toxin causes renal infiltration and renal degeneration, the former occurs first and is independent of the latter. The production of a pure tubulitis, without leucocytic infiltration, proved a more difficult matter. Bierry and Feuillié succeeded in producing this condition by means of the brief ligation of the artery or vein of one kidney. An intense nephritis (tubulitis) of the other kidney ensued without a trace of leucocytic infiltration. The two processes, while usually associated, are thus seen to be essentially distinct and more or less independent.

The resulting albuminuria they consider due exclusively to the leucocytes which penetrate the glomeruli and are disintegrated in the urine by the action of the urinary and leucocytic ferments. That the body is able to furnish masses of leucocytes sufficient for any degree of albuminuria is shown by the processes that take place in pneumonia for instance. Thus, a man with a leucocyte count of 10,000, corresponding to 10 grams of white corpuscles for his entire body, may within twenty-four hours show a count of 40,000, indicating a production of 30 grams of leucocytes within this interval. Similarly a dog, weighing 15 kilograms, which at the most possesses 2 grams of leucocytes, will readily furnish 500 grams of thick pus from an abscess produced by the injection of turpentine. However they do not assert that in all cases of parenchymatous nephritis, the entire amount of albumin is produced by means of leucolysis. They recognize three varieties of albuminuria:

1. That due to the passage into the glomeruli of leucocytes, chiefly lymphocytes;
2. Albumin from the plasma that leaks into the glomerulus, through the momentary orifice made by the leucocyte as it enters;
3. Albumin from the plasma that enters the glomeruli through more or less permanent perforations produced by the degenerative actions of toxins. It is this condition that offers an explanation of the occurrence of hematuria in chronic nephritis.

The independence of albuminuria and of nephritis is further shown by another interesting series of experiments. If a dog is subjected to a number of sterile abscesses by means of the hypodermic injection of oil of turpentine an enormous amount of pus can be evacuated within five or six days. The blood of such an animal shows a complete disappear-

ance of degenerated white corpuscles and the writers conclude that only the most resistant have remained in the circulation. On the other hand, it is well known that the injection of considerable quantities of corrosive sublimate into a dog will produce an acute nephritis with albuminuria, and it is ordinarily assumed that this albuminuria is due to the nephritis. If, however, the sublimate is injected into a dog that has been subjected to these sterile abscesses, no albuminuria will result, in spite of the production of an extremely severe nephritis. The poison fails to produce a leucopathy, there is no excretion of leucocytes by the kidney, and the cause of the toxic albuminuria does not come into play. Similarly, if, instead of injecting a single large dose of sublimate, we inject a smaller amount daily, we have at first a nephritis with marked leucocytic infiltration and great albuminuria. If we continue these daily injections, however, the amount of albumin in the urine steadily diminishes and usually, by the sixth or seventh day, the urine is free from albumin. The dog regains his appetite, seems well and, if killed about the twentieth day, will be found to have an enormous nephritis without a trace of leucocytic infiltration, the urine during this period having remained free from albumin. The successive injections of sublimate have thus acted like the sterile abscesses in freeing the blood from the more fragile leucocytes and have thus deprived the diseased kidneys of the source of their albuminuria. Feuilleé suggests that this may explain the beneficial influence of mercury and other poisons in therapeutic doses. However this may be, the experiments seem to show that while albuminuria usually accompanies kidney disease, it is by no means due to the latter. The true explanation is that both nephritis and albuminuria are concomitantly but independently produced by the same toxic agent.

Experimental evidence has also been adduced that throws light upon the production of interstitial nephritis. If any one of a number of toxic agents is injected into dogs daily in small doses and the kidneys are examined at varying intervals, it is found that the enormous collection of leucocytes about the tubules gradually gives place to fibrous tissue, which contracting produces a typical interstitial nephritis. Thus the kidney may be injured not only directly by the same toxin that produces a leucopathy but indirectly by compression, fibrous tissue resulting from the leucopathy itself. For it is the latter that is responsible for the accumulation in the kidney of the moribund leucocytes that later are converted into or at least lead to the formation of fibrous tissue.

Another interesting conclusion drawn from this work is that the albumin in the urine of nephritis is never excreted through the walls of the tubules, however degenerated the latter may be, but always and exclusively through the glomeruli. Lack of space, however, forbids us entering on a consideration of the experiments upon which this conclusion is based.

Hemoglobinuria. The same general principles that govern the production of albuminuria hold true with regard to hemoglobinuria. It is generally assumed that the toxin responsible for this affection first produces a hemoglobinemia and that this free hemoglobin is then excreted by the kidneys. This is apparently not the case. Hemoglobinuria is practically never accompanied by hemoglobinemia. The red corpuscles in this condition are fragile, and the serum of the blood, after coagulation, contains free hemoglobin, but the plasma of the uncoagulated blood does not. If the blood from a patient undergoing an attack of paroxysmal hemoglobinuria is centrifugated rapidly or is allowed to flow into a solution of sodium citrate, the plasma will be found free from hemoglobin. The

reason the serum is colored red is that the red corpuscles in this condition are so fragile that they disintegrate during the process of coagulation and the hemoglobin thus set free is dissolved in the serum. Conversely a pure hemoglobinemia never produces a hemoglobinuria. This is shown by the well-known experiment of injecting hypodermically or intravenously enough of a solution of pure hemoglobin to color the plasma bright red. A hemoglobinuria never results. On the other hand the injection of substances productive of fragility of the red corpuscles, such as the hemoglobin-free stroma of red corpuscles or the juice of red muscle, will invariably produce hemoglobinuria.

The condition of the kidneys in these cases of experimental hemoglobinuria, too, is interesting. In no case was there found any evidence of the passage of hemoglobin or of red corpuscles through the walls of the tubules. There was, however, invariably present a diapedesis of red corpuscles into the lumen of the glomeruli and evidence of the destruction of the corpuscles in the hypotonic urine there present. Thus the production of hemoglobinuria is analogous to that of albuminuria. In the former case we have a toxic fragility of the white blood corpuscles. These pathologic corpuscles accumulate in the kidney, penetrate into the lumen of the glomeruli and are there dissolved, setting free albumin. In hemoglobinuria, the same process takes place with the red blood corpuscles.

Edema. Similar results, which if not so convincing are suggestive, have been obtained with regard to edema. If a solution of sublimate, 1 to 1000, is injected hypodermically, a marked local edema results. A microscopic examination of the tissue shows vaso-dilatation and, in the edematous fluid, a considerable number of badly disintegrated white corpuscles. Now, Pigache and others have shown that various pathologic albumins, such as would be set free by the necrosis of leucocytes, may attract great quantities of sodium chloride and water, enough to form an edematous mass at least 30,000 times the bulk of the particles of degenerated proteid. Feuillie believes that the edema after injection of sublimate is due to the attraction for water exercised by the disintegrated corpuscles. If, now, this injection is repeated daily in different spots on the same dog, the resulting edema grows steadily less, and finally only a firm nodule results. This nodule on examination also shows vaso-dilatation but no emigration of injured leucocytes and no extravasation of fluid. Apparently the successive injections of sublimate have rid the body of fragile leucocytes and as the injections, after a while, cease to cause albuminuria, so they cease to produce a local edema. This inflammatory edema, then, is also an expression of what he calls a leucopathy, and, like the accompanying albuminuria, ceases when only the sturdiest leucocytes are left in the body. Similarly, after a prolonged series of sterile abscesses, the injection of sublimate or the local application of croton oil fails to produce edema and results only in a hard nodule. Feuillie suggests that the edemas of nephritis and of heart-failure may be due to the extravasation in the most dependent parts of the least sturdy of the leucocytes. These undergo disintegration there, attract salt and water, and so produce the characteristic edema.

Leucopathic Icterus. Just as leucocytic fragility may lead to the accumulation of injured white corpuscles in the kidney causing albuminuria, so we may have a similar accumulation about the bile ducts in the liver, causing an icterus. Various toxic agents will cause this phenomenon, but the most constant results are obtained with tolylenediamine, the injection

of which is followed, within a few hours, by an intense jaundice. A microscopic examination of the liver shows about the bile passages an accumulation of leucocytes in such numbers as to produce definite biliary obstruction by pressure. In the more chronic cases, especially after successive injections of cantharidine, the conversion of these leucocytic masses into fibrous tissue can be observed. In all these cases of experimental icterus, the examination of the blood showed a condition of leucocytic fragility. In a number of cases of so-called "hematogenic icterus" a similar combination of leucocytic fragility with accumulation of leucocytes about the intrahepatic bile ducts was observed.

CRITICAL REMARKS ON THE ASSUMED ADVANCE IN OUR
KNOWLEDGE OF THE CANCER PROBLEM.

A REVIEW OF RECENT LITERATURE.

By CARL FISCH, M. D.

1. THIRD SCIENTIFIC REPORT. PUBLICATIONS OF THE IMPERIAL CANCER RESEARCH FUND.—Taylor and Francis, London, E. C. 1909.
2. ABOUT THE CANCER OF MEN AND ANIMALS.—C. F. Bashford (*Berl. Klin. Woch.*, 1909, Nos. 36 and 37).
3. GROWTH OF EMBRYONIC SUPRARENALS IN THE ADULT KIDNEY.—Hugo Neuheusser (*Deutsch. Med. Woch.*, 1909, No. 8).
4. METASTATIZATION OF A BENIGN TUMOR.—F. Bormann (*Deutsch. Med. Woch.*, 1908, p. 93 F.).

The purpose of the critical review of Bashford's work on his investigation of the nature of carcinoma, is that it must involve most of the work done lately by other workers on the subject, so that it will give an adequate representation of the status of our present knowledge. That this will not show a great, or any, advance in our knowledge is the object of considering mainly the conclusions drawn by Bashford and his collaborators from their investigations. The literature on the problem, so far entirely obscure, and on the attempts to explain it, has led in some cases to what we call "interesting" results, that is to say, new facts, but facts relating only to details, that are individually new data, but do not serve as such to establish understanding of the process in its course or of its causation. These facts will in the future be welcome, when means have been found to solve the problem in a logical way. That so far all explanations of the origin or cause of cancer are subjective, teleologic, is a well-known conclusion of all that have given this subject an objective scrutiny, among others, Ehrlich and Harland. The great drawback in the search for the cause of cancer is the opinion that it is something different from the body of the organism, that it is an agent that is in a fight with the body and often is the victor. This is what led Ribbert to call the cancer cells parasites. This is, of course, only a conclusion from the known effects of parasites that enter the body from the outside, and that are only one factor in causing so-called pathologic changes in the physical and chemical processes of what we call life. What the real cause of these alterations is, we do not know with regard to any infection, and what the "nature" of the means of warding off these alterations is, is unknown. The only logical explanation so far for all these phenomena is the chemical theory of Ehrlich, the so-called "side-chain" theory. It deals with the character of processes in the organism and reasons that the reactions in these "pathologic" processes are not new, but only exaggerated in intensity—an assertion that by experiment can be proved by thousands of exact and almost mathematically correct confirmations.

Cancer is not foreign to our body, it is part of it, that only by so far unknown factors alters the physical and chemical processes of it by allowing certain parts of it to become different from the usual relations to the rest of the organism.

The cause of the beginning of a carcinoma is so far unknown. There is no evidence for a cause by outside parasites, or by chronic inflammatory processes, or by injurious lesions of the areas where cancer grows. For none of the multifold theories of the origin of cancer has a logical scientific proof so far been given. As is the case with almost all other great discoveries (as also Bashford suggests), it will be by a fortunate accident that an observer will some time find the "cause." Our methods, so far, are insufficient for this purpose. The enthusiasm for search during the last few years has subsided, and work is limited either to routine work or to biologic utilization of the mice experiments for speculative theories.

Important as it is, the possibility of transplanting carcinoma from one animal to another, and thus obtaining experimental facilities for the study of the growth and development of the tumor and its so-called biologic character in its different stages, will not throw a light on the cause of cancer, for the transplantations start from a tumor spontaneously grown. The importance of this transplantation lies in the facility it affords for controlling the growth of the implant in all phases. Jensen, the first to succeed in transplantation, has already stated a fact whose importance has not received adequate consideration—the fact that the growing transplant does not grow by changing tissue cells of the host to tumor cells. In dealing with the cancer problem in a scientific way, the question of the origin from normal tissue or from tissue primarily different has to be considered. Bashford teaches that cancer cells arise from "normal" cells, that the variety of cancer cells is great, that the transition between "normal" and "abnormal" cells is the result of his investigations, the details of which, however, have not yet been published. He agrees in this view with the main defender of it, Hauser. The mistakes that lead to this interpretation have been shown so often that it is unnecessary here to detail them. A carcinoma grows only by multiplication of its own cellular structures, it destroys and wedges out surrounding tissue, but never embodies it as cancer cells into its mass. The direct proof that from the earliest beginning cancer is specifically defined from the neighborhood, of course, can not so far be given. It was, however, found by Bormann that a cancer of the skin that in section exhibited only thirty cells, was already absolutely defined from the normal epithelium. It may be possible to find still smaller stages by systematically studying areas of skin for which cancer has a predilection. The fact that cancer grows out of itself does away with all theories that external or internal changes cause the change of "normal" cells to cancer cells. Bashford maintains that the whole surface of the body is able to form cancers. Nevertheless, he has shown by painstaking work in getting information about the location of the tumors in all parts of the earth from which reliable material can be obtained, that this work is exceedingly interesting and valuable in the direction of the suggestion that the difference of the tumors in location in different countries may be due to external influences, such as, for instance, that in Kashmir the natives develop in great numbers a skin cancer over the abdomen, because they carry a small oven filled with wood-coal over the naked skin of the abdomen. There is no objection to the assumption that a chronic irritation of an area with a minute cancer could possibly stimulate prolifera-

tion. In the abdominal skin cancers, of course, only the navel is the seat of the primary growth.

The locations of different types of cancerous tumors vary greatly. Most of the skin carcinomata arise in the region of the naso-labial line; the rest are found on the lips, nasal opening, and the conjunctiva, the sphincters of the rectum, and on the vagina and penis. If these tumors, except the naso-labial tumors, are seen early, they always are found located at the junction of the mucosal and cutaneous epithelium. The tumors lie along the line of the fetal naso-labial slit, in the course of this line in the adult. The closing of the slit is performed by the epithelium growing from both sides over it and joining, a process that occurs in the same way in all places indicated for the other skin cancers, where mucous and cutaneous epithelium join. Bashford has not paid attention to this, although it has been known for a long time, but assumes instead an indefinite constitutional disturbance, a simple vitalistic phantasm, for the predilection of tumors for certain areas; this fact ought to have led to investigation of the anatomic structure of the location. That certain structures are so much more the seat of cancerous and other tumors—as, for instance, the female breast, the uterus and the digestive tract—is well known. A reason for it is not given. In all these organs during fetal life complex combinations of different tissues take place in the forming of them. We know that this process of combination does not always result in success, the factors bringing it about by mechanical changes. This leads to malformations and other bodily changes. These changes in the course of the formation of the adult organism cannot originate in the adult, but they can remain unnoticed and become apparent only in later life. These facts led Cohnheim to the thought that tumors were also due to disturbances in the formation of the fetal body, and since displacement of tissues and complexes of cells was shown to occur, he suggested that tumors belonged to this displacement as the primary cause of these growths. With the many facts known about the matter, and with the impossibility of directly giving evidence for the truth of the theory, Cohnheim's thoughts have been discussed in several directions, mostly with denial of their correctness. Lately, there is a tendency to explain by it the peculiar location of certain tumors in certain organs or structures. This was due to the finding accidentally in studies for other purposes, for instance, carcinomata of the face, carcinomata of only microscopic size. As remarked above, they were definitely defined from the surrounding tissue and epithelium. At the location in the region where the fetal naso-labial cleft closed, there was not often union of the two closing lines of epithelium in conjunction with the two mathematical lines parallel in the closure. There is some bulging and pressure on the growing young tissue in the process and minor fragments of the tissue are separated and remain as an isolated mass in the underlying tissue. Such nests can be found in fetuses in that region and they can be found still more easily in cross sections through the maxilla, where they lie below the dipping down tooth-forming superficial epithelium. Investigation in this direction in great numbers would establish this observation as a general fact. Of course the causative connection of this fact with the later appearance of a tumor in the same place is not brought out by this coincidence; there is no exact series of facts on hand that would suggest a process dating from the time of fetal life to the tumor in old age. Against the possibility of such a condition, which Bashford asserts to be absolutely impossible (others, too, like Hansemann, are of the same opinion), the objection is made that displaced fetal tissue, about the

existence of which there is no doubt, cannot remain latent or dormant for so long a time. On the other hand, experimentally many attempts have been made with transplantation of fetal tissues, with ordinarily negative results, especially with nothing pointing to the formation of a tumor. In the absence of any positive logical demonstration of the truth of this theory, the ideas of Cohnheim are beginning to be considered to-day as the most probable explanation of the first feasible cause of a tumor. We are fortunate enough to have to-day at least one evidence that fetal tissue can in the same species, when adult, cause the growth of a tumor. Neuhäuser transplanted the suprarenals of fetuses of rabbits into the kidneys of adult rabbits. After completely negative results he used the suprarenals of fetuses near term. In two cases he obtained results. The transplant in one formed a large tumor, which might be called hypernephroma. It was circumscribed, and did not invade the kidney tissue. In the other, the tumor formed by the transplant invaded, by means of the vessels and lymphatics, the kidney tissue, destroying large portions of the organ. This would at least show that immature fetal tissue implanted into a location where it finds the proper soil, can grow, and not only grow, but in growing can pass from its undifferentiated state to the differentiated character of the mature tissue. The observation is certainly a strong indication that Cohnheim's ideas will be substantiated by further work. Still, for the present, the cause of cancer and of most of the other tumors is as obscure as ever. All the work on cancer has not succeeded in this direction. Especially the cause of malignancy of some tumors, the dissemination of them from the primary location to other places, is "absolutely" unexplained. The problem of the cause of cancer is still not answered by a causative process. All the work done is acceptable as a basis of established facts and experimental methods that, in the future, may be of value. So far it has not advanced our knowledge, nor has it accomplished anything towards dealing practically with cancer better than has been done all along.*

Bashford believes that he has thrown some light on the etiology of cancer in four directions: First, the constitutional conditions that are favorable or unfavorable for the change to the cancer cell. Second, that the cancer cells, after passing a stage of depressed proliferation, gain a high power of growth and great resistance against changes in their surroundings. Third, that attention has been called to the probable relation of stimuli to the beginning of the growth of the tumor. Fourth, that the cancer cells, even when they belong to a single organ, can be divided into a great number of different groups, which in metastases retain their individuality—a matter that formerly never even was guessed at. These differences cannot be determined histologically. The author says that his biologic experiments have put aside old problems, and that he has given new problems. We wish he would solve them.

The actually acceptable work is represented by painstaking, tedious and laborious compilation and critical statistics of certain features of the cancer problem, as far as its location, frequency, or character on our earth are concerned. The real problems of carcinoma have only been dealt with with preconceived ideas, and have led, as the above quotations of the four points in etiology show, to biologic phantasms.

So far as the physiological and chemical characteristics of the cancerous process are concerned, the only man who has attacked it in a

*Bormann has lately described a tumor that histologically was benign, but nevertheless became metastatic.

scientific way is Ehrlich, who, with his athreptic theory, has given a heuristic statement that cannot be ridiculed, as Bashford does, like the ridiculing of Ehrlich's side-chain theory, which up to to-day forms the basis without which we should not know anything about immunity, anti-toxins, and other immensely important and, up to Ehrlich's time, incomprehensible processes in many so-called pathologic conditions. Ehrlich's basis for his theory is not biologic, but strictly physical and chemical, which is forgotten in judging about it. If the cancer investigation were carried on in this way, not biologically, but by trying to find the physical and chemical reactions in the life of cancer, the outlook would be as good as it has been for the side-chain theory. Histology will in no way alter our views. It is settled and has shown that it cannot have any importance for the basic questions.

ADENOIDS IN INFANCY.

A REVIEW OF RECENT LITERATURE.

By WM. B. CHAMBERLIN, M. D.

1. ADENOID HYPERTROPHY DURING THE FIRST YEAR OF LIFE AND ITS TREATMENT.—Freeman (*Journal Amer. Med. Assn.*, August 21, 1909, p. 605).
2. ADENOIDS IN INFANCY.—Morse (*Journal Amer. Med. Assn.*, November 9, 1907, p. 1589).
3. DISEASES OF THE NASOPHARYNX IN INFANCY.—Morse (*Boston Med. & Surg. Journal*, April 18, 1907, p. 489).
4. DISEASES OF THE NOSE, THROAT AND EAR.—Ballenger (Second edition, p. 319).
5. THE NOSE AND NASOPHARYNX IN INFANTS AND YOUNG CHILDREN.—Ingersoll (*Laryngoscope*, December, 1909).
6. SOME OBSERVATION ON THE SO-CALLED ADENOID VEGETATIONS IN INFANCY AND CHILDHOOD.—Longworthy (*Dental Review*, August, 1909, p. 693).
7. COLIC IN AN INFANT DUE TO ADENOID HYPERTROPHY.—Wallin (*Jour. Amer. Med. Assn.*, October 6, 1909, p. 1188).
8. ADENOIDS AND FEEDING OF INFANTS IN RELATION TO THE GROWTH OF THE JAWS.—Colyer (*Proceedings of the Royal Society of Medicine*, November 23, 1908, p. 9).
9. ADENOIDS IN INFANTS.—Jarecky (*N. Y. Medical Journal*, Vol. LXXX., p. 309).
10. DISEASES OF THE NOSE, THROAT AND EAR.—Knight & Bryant (Second edition, p. 205).

The important part played by adenoids in the production of many of the diseases of childhood and adolescence has been more and more appreciated by specialists and practitioners ever since Meyer's epoch-making paper in 1880. There are few in the profession to-day who are not aware of the dangers arising from adenoids and awake to the symptoms which they may produce. The knowledge possessed by the laity in regard to the symptoms arising from adenoid hypertrophy is frequently surprising. But the subject of adenoids in infancy has been more tardily recognized. Few specialists, and still fewer practitioners, at the present time seem to recognize their importance or to be able to make a diagnosis. Many an infant is accordingly condemned to years of suffering, not to mention the attending dangers of life, due to the mental apathy of those who should be their protectors.

This tardiness of the profession may be ascribed to several causes. Among the first may be mentioned the difficulty of making a diagnosis *objectively*. In most cases this is manifestly impossible. In older children adenoids are diagnosed by means of the post-nasal mirror or the finger passed behind the soft palate, as well as by the facial expression and development. In all infants the use of the mirror is impossible, the finger

can only be used as a means of diagnosis in children of eight months or over; while facial development or expression can play but a small part at so early an age. Objectively, adenoids can be diagnosed only in those rare cases where the adenoid mass projects below the velum palati or where it can be seen when the soft palate is retracted. But fortunately there are a train of symptoms which make the diagnosis of adenoids in infancy most probable and in many cases absolute. Freeman (1) gives these symptoms as mouth breathing, snuffles, frequent colds, poor nursing, snoring, cough, and otitis media. Morse (2 and 3) mentions in addition the malnutrition from lack of air as well as food, loss of sleep, catarrhal laryngitis, and spasmodic croup.

Adenoids may occur very early in life. They may even be congenital. Ballenger (4) in the second edition of his text book says that adenoid hypertrophy usually occurs between the ages of six and fifteen. Its occurrence and importance in the earlier periods of life is not referred to.

Morse, Ingersoll (5) and Freeman (1) all note the anatomical differences between the infant and adult pharynx and nasopharynx, not only as regards size, but as regards shape as well. According to Morse the nasopharynx at birth is from 6 to 7 mm. high by 9 mm. wide, while the distance from the hard palate to the posterior wall of the pharynx is almost as great in the infant as in the adult. The nasopharynx doubles in size at six months and then remains practically stationary until the end of the second year. Morse compares its size at birth to the tip of a medium sized male catheter. The nasopharynx of an infant as compared to that of an adult is relatively long, but flat and narrow, so that a comparatively small amount of adenoid tissue would cause a relatively great disturbance, resulting in more or less complete nasal obstruction. When it is remembered that the infant is dependent on the act of sucking for its food and that the ability to suck freely necessitates the free access of air through the nose, the dangers to nutrition alone resulting from nasal obstruction may be at once imagined.

A second cause for the lack of more general knowledge on this most important subject has been the reluctance, or even refusal, of rhinologists to operate on cases referred to them by pediatricists who appreciated the condition at hand. Morse makes mention of this fact. Operation in such cases is too frequently delayed with the suggestion that the child will outgrow the adenoids or that it is better to wait until the child is older. Certain specialists hesitate at operation, not only on account of a fancied fear of increased danger at early ages, but also from the feeling that the growth is more likely to recur. Freeman insists that adenoids should be removed as soon as they present symptoms, while Morse regards the liability to recurrence as overestimated and as no contra-indication to operation. He adds that it is far better to operate a second time, should occasion arise, than to delay the primary operation. The danger from the operation he regards as slight, and not to be compared to the dangers arising from the adenoid mass, if left in situ. Longworthy (6) thinks that it is never safe to wait for shrinkage as the damage then is already done.

Adenoids in infancy, too, predispose to otitis media on account of the low position of the tube, its decreased length, and its greater patency at this age, causing it to afford freer ingress for pathogenic bacteria. Snuffles is another important symptom. Freeman regards most cases of snuffles during the first year of life as due to adenoids, and mentions the frequency with which syphilis is wrongly diagnosed in such cases. Other evidences of syphilis are, however, lacking, while an early operation will

cause all symptoms to disappear. In addition to the more common sequelæ, Morse calls attention to the association of rickets in such cases, as well as convulsions and laryngismus stridulus. Wallin (7) reports a case of persistent colic in an infant where all symptoms were relieved by the removal of the adenoid tissue. Certainly, such a weight of evidence should call the attention of the members of the profession to the importance of the condition and place them on the lookout for characterizing symptoms.

To summarize:

I. Adenoids in infants are relatively common. They may be congenital.

II. The dangers from adenoid hypertrophy are fully as great in infancy as in childhood.

III. Adenoids in infants should be removed as soon as they present symptoms.

IV. Adenoids in infancy are not likely to recur. If they do, it is better that the child should have a second operation than that the first operation should be delayed.

POLIOMYELITIS ANTERIOR.

A REVIEW OF RECENT LITERATURE.

By NATHANIEL ALLISON, St. Louis, Mo.

1. STUDIES ON THE ETIOLOGY OF EPIDEMIC INFANTILE PARALYSIS.—P. H. Romer (*Münch. mediz. Wochensch.*, December 7, 1909).
2. MULTIPLICITY OF SYMPTOMS AND LESIONS OF SO-CALLED ACUTE EPIDEMIC ANTERIOR POLIOMYELITIS.—L. Lhermitte (*Semaine Médicale*, November 24, 1909).
3. TREATMENT OF THE EARLY STAGE OF ACUTE ANTERIOR POLIOMYELITIS.—G. Hohmann (*Münch. medicin. Wochensch.*, Dec. 7, 1909).
4. THE EPIDEMIC OF SPINAL DISEASE IN NEBRASKA.—George P. Shidler (*Journ. of the Amer. Med. Assn.*, January 22, 1910).
5. EPIDEMIC POLIOMYELITIS.—F. Kramer (*Medizinische Klinik*, Dec. 26, 1909).
6. OBSERVATIONS ON THE OCCURRENCE OF EPIDEMIC INFANTILE PARALYSIS.—Wollenweber, Dortmund (*Zeit. für Medizinalbeamte*, No. 21).
7. THE INCREASE OF ACUTE EPIDEMIC INFANTILE PARALYSIS IN THE VICINITY OF GIESSEN.—Langermann (*Berl. klin. Wochensch.*, Dec. 27, 1909).
8. REPORT OF THE WESTPHALIAN EPIDEMIC OF ACUTE INFANTILE PARALYSIS. Preliminary Report.—Paul Krause, Bonn (*Deut. med. Wochensch.*, October 21, 1909).
9. THE ETIOLOGY OF ACUTE EPIDEMIC INFANTILE PARALYSIS.—Paul Krause, Bonn, and Ernest Meinicke (*Deut. med. Wochensch.*, October 21, 1909).
10. ACUTE SPINAL INFANTILE PARALYSIS IN THE RHENISH-WESTPHALIAN INDUSTRIAL DISTRICT.—Reckzeh, Bochum (*Medizin. Klinik.*, 1909, No. 45).
11. THE TRANSMISSION OF ACUTE POLIOMYELITIS TO MONKEYS.—Simon Flexner and Paul A. Lewis (*Journ. of the Amer. Med. Assn.*, November 13, 1909).
12. ACUTE ANTERIOR POLIOMYELITIS WITH AUTOPSY.—Colin K. Russel (*Montreal Medical Journ.*, December, 1909).
13. THE TREATMENT OF THE PARALYTIC DEFORMITIES OF CHILDREN.—R. W. Lovett (*International Congress in Budapest*, 1909).

Romer's opinion, based upon his own experiments and on work done by others, is that poliomyelitis follows the invasion of the organism by a specific germ. This germ is difficult to stain or to cultivate but it is found in the brain and spinal cord of the victims of this disease. It can also be inoculated into apes and transferred from them to other apes.

Lhermitte is of the opinion that further study of the lesions of the brain and spinal cord which follow acute meningitis will explain the close relationship between the epidemic of acute spinal paralysis in children and adults and the epidemics of cerebro-spinal meningitis. He believes

that the various epidemics include several inflammatory affections of the nervous system which have been reported as anterior poliomyelitis, and offers as evidence the variation of the prognosis clinically seen in the cases commonly grouped under the term anterior poliomyelitis. A differentiation between a meningeal paralysis and a paralysis following anterior poliomyelitis can be made by the meningeal symptoms—the severe pains in the limbs and the slow disappearances of the paralysis and the absence of atrophy in the muscles involved.

Hohmann has applied plaster-of-paris jackets to two infants who had severe pain in the back, accompanying the paralysis of anterior poliomyelitis. These jackets quickly relieved the symptoms in both cases. He is of the opinion that this treatment not only relieves pain but may also prevent spread of the lesions.

Shidler reports an epidemic of 72 cases which occurred in Nebraska during the summer of 1909. Here the disease was apparently transmitted through a large celebration with excursions from the surrounding towns. The incubation period was from 5 to 13 days. Age limits were from 5 months to 30 years. Twenty-five per cent. of the patients were under 3 years of age. Most of the cases occurred in families where there were several children. The symptoms were those commonly seen in poliomyelitis. In a number of cases only incoordination existed. The legs were more commonly affected with flaccid paralysis. There was good recovery in the mild cases but the more serious cases did not recover, and showed only slight improvement. Final atrophy was well marked in certain groups. The mortality was 11 per cent.

Kramer goes over the recent epidemic and points out that the mortality of the disease is higher than we have heretofore supposed, as is also the number of cases which made complete recovery. He thinks that during the acute stage rest and mild measures to produce sweating should be employed. In the Breslau clinic, in 196 cases the age ranged from infancy to 30, but only 24 of the patients were above 5 years. Most of the cases were in the summer.

Wollenweber goes over 31 cases which were observed in Dortmund. He gives as clinical symptoms sudden onset with vomiting, diarrhea, fever, paralysis of the legs more often than the arms, and sometimes only a single muscle group paralysis; tendon reflexes absent, consciousness preserved. The patients that died, died of paralysis of respiration. He believes it to be an infectious disease with diarrhea, apparently contagious; incubation 2 to 14 days. He believes that the stools and the surroundings of the patient should be disinfected and the patient kept in isolation.

The epidemic reported by Langermann occurred in the village of Garbenteich, in September to November of 1909. It was transported from Marburg where there was an epidemic. Eight cases were observed, 2 abortive and 3 fatal. The clinical symptoms observed were perspiration, quickened respiration, restlessness and flabby paralysis of the neck, and of the abdominal and back and leg muscles. In more than half of his cases there was intestinal involvement. He gives the incubation as from 3 to 7 days. The virus is resistant and is apparently disseminated by contact.

Krause, in reporting the Westphalian epidemic, says that it is an infectious disease because it attacks children in the neighborhood and is transmitted along the path of communication between towns. It is essentially a disease of childhood and children are most susceptible in their second year. Adults are rarely attacked. In the Westphalian epidemic

young fowl were fatally affected. He believes that the portal of entrance is the intestinal tract, for in 90 per cent. of the cases there were intestinal symptoms. Food for vermin appeared to have no connection with the onset.

Krause has examined material from the blood, spinal fluid, tonsils, stools, and urine of living cases and has also made experiments and injections into animals of material from fatal cases, but has not revealed the specific cause of the disease. The rabbits into whose peritoneal cavities the injections were made, after a long period of good health, showed changes in the central nervous system and quickly died.

Reckzeh reports 500 cases that occurred in the district of Arnsberg in 1909. Ninety-three of these cases he observed. The clinical picture so well recognized was seen in these cases. The mortality was 18.2 per cent. He believes one patient died of toxemia of the heart muscle.

The most interesting work that has been done on the transmission of the etiology of acute poliomyelitis is that of Flexner and Lewis. Their work has been on monkeys, and in them the virus has been transferred through three *generations* of monkeys, and the authors believe it could be carried on indefinitely. Triturations of the cord, passed through Berkefeld filters, were inoculated into monkeys and the typical paralysis developed. From these experiments it appears that the infective agents belong to this class of minute and unfilterable viruses. Flexner and Lewis' work has been extensively reviewed and has been the most conclusive that has yet been accomplished.

Russel has reported 2 cases with autopsy. He thinks that the disease is a general infection, affecting most particularly the spinal nervous system and meninges, and not alone the spinal brain matter supplied by the anterior spinal artery. He believes that there are also sensory changes which are not detected because we are generally dealing with children.

R. W. Lovett, in a most interesting paper read at the International Congress at Budapest, classifies the deformities into 7 groups. He shows the necessity of preventive treatment of deformities and says that in almost all the cases the paralysis deformity can be prevented by appropriate apparatus. He believes that the cases should be carefully selected for operation, and that the operation should be carefully planned and should be supplemented by proper exercises and educative measures; also that many of the failures following tendon transplantation, etc., have resulted from lack of proper oversight in the after-treatment.

BONE GRAFTING AND TRANSFERENCE.

By MALVERN B. CLOPTON, M. D.

1. BONE TRANSFERENCE.—Codman (*Annals of Surgery*, Vol. XLIX., No. 6).
2. THE GROWTH OF THE BONE AGAINST RESISTANCE.—Kerr (*Surg. Gyn. and Obst.*, Vol. X., No. 4).
3. BONE TRANSFERENCE.—Huntington (*Calif. State J. of Med.*, October, 1909).
4. THE OCCURRENCE OF PARTIAL SEQUESTRATION OF TRANSPLANTED BONE TISSUE.—Axhausen (*v. Langenbeck's Arch.*, Bd. LXXXIX., Hft. 2).
5. BONE PLASTIC AFTER RESECTION OF THE LONG BONES.—Buttner (*Zentralbl. f. Chir.*, 1910, No. 16).
6. HOW LONG AFTER DEATH OR AMPUTATION DOES THE BONE REMAIN USEFUL FOR TRANSPLANTATION AS REGARDS FREEDOM FROM INFECTION.—Bregemann (*V. Langenbeck's Arch.*, Bd. XC., Hft. 2).
7. THE HISTOLOGY OF FREE TRANSPLANTED PERIOSTEAL BONES IN MAN.—Läwen (*Arch. f. klin. Chir.*, Bd. 90, No. 21, p. 469).
8. THE USE OF FREE BONE PLASTIC AND ATTEMPTS AT BONE TRANSPLANTATION.—Lexer (*Arch. f. klin. Chir.*, Bd. LXXXVI., Hft. 2, p. 939).
9. SUBCUTANEOUS AND INTRA-MUSCULAR BONE FORMATION AFTER INJECTION AND IMPLANTATION OF AN EMULSION OF PERIOSTEUM.—Nakahara and Dilger (*Beitr. z. klin. Chir.*, Bd. LXIII., p. 235).
10. INTRA-HUMAN BONE GRAFTING AND REIMPLANTATION OF BONE.—Macewen (*Annals of Surgery*, Vol. L., No. 6).

In cases of osteomyelitis where subperiosteal reaction has been practiced for a considerable length of bone, occasionally the periosteum does not give rise to a new shaft. In such a case Huntington suggested that the tibia be transferred to take the place of the fibula and he found that it hypertrophied after transfer, and became virtually as strong as the former tibia. Stone has reported two such cases and Codman reports another. In this case, the tibia after a long and recurring osteomyelitis had its shaft completely resected subperiosteally. After a year there was no regeneration of the tibia, so the fibula was cut across and its end transferred to the cleaned end of the tibia. The old ulcer that had persisted over the lower end of the bone was closed by a large flap. After three years the result is a sound useful leg, which bears all the weight. The bone has markedly hypertrophied.

In a case of a boy, 10 years old, whose diaphysis, lower epiphysis, and part of the astragalus were removed for osteomyelitis, after the infection had been controlled, Kerr implanted the lower end of the fibula into the upper surface of the astragalus and did arthrodesis at the superior fibulo-tibial articulation. As one-fourth of the growth comes from the upper epiphysis of the tibia, it is important that this growth point be retained, and by the method used the fibula was to supply this development.

In three years since the operation the fibula has grown 3.5 c.m. and if this continues until the patient has attained full growth he will avoid severe crippling deformities, viz., much greater shortening, a talipes varus, and possibly one or both annoyances incident to the displacement of the fibula upward. The boy has a useful leg and foot.

Huntington reports a case of osteomyelitis in which the middle of the shaft of the tibia failed to develop and the fibula was made to take its place by carrying the divided end of the fibula across to the tibia, and counter sinking it into the upper remaining fragment of the tibia, where union was secured. The result was good, the patient walked, and the fibula hypertrophied. The foot, however, bowed on the fibula, so that six months after the first operation the fibula was divided at a point opposite the upper end of the lower segment of the tibia and the transfer was completed. In six weeks the child began to walk and the radiogram shows the fibula to have assumed the dimensions of the normal tibia.

It is contended by Axhausen that in the implantation of bone with periosteum, even in the absence of infection, the implanted bone is not adopted, but remains as a sequestrum or is discharged as such. In one case a girl with a metastasis of carcinoma in the humerus had this bone resected and a metatarsal bone implanted. On account of a fistula a second operation was performed, and after the discharge of the head of the metatarsal the wound healed and became solid. There was later a recurrence, on which the bone was again resected, and the metatarsal was found dead in the center of the living and active periosteum, which had built strong bone about the original transplant. A part of the medulla remained at the end where there was a callus with light union with the humerus. Despite infection and notwithstanding necrosis of the bone tissue, in men the great proportion of implanted bones remain, and after a partial sequestration a sound bony union follows. The practical application of the osteoplastic method must be reserved for cases in which the strictest asepsis can be followed, and not be used to relieve tuberculosis with sinuses, or for a plastic on the lower jaw.

In a case of sarcomatous bone cyst Buttner removed the lower third of the tibia, with the exception of the lower epiphysis and a small strand of periosteum. The remaining part of the tibial shaft was then split with a Gigli saw and a chisel from the tibial tubercle downward, and the half was separated from the periosteum and rotated through 180 degrees, the upper end being implanted into the lower epiphysis. The defects in both parts of the bone were then filled with iodoform bone wax, and the wound was closed. The healing was perfect, and in six weeks the child was walking on the leg. The leg is firm and remains free from recurrence.

Bregemann studied bones removed from cadavers and found that in the first twelve hours after death there was no bacterial invasion of the osseous system, and that the bones were useful for transplantation, so far as infection is concerned, at any time up to 12 hours as they are sterile at least up to that time. Amputation bone remains germ free from 13 or 18 hours, if the amputation is not done for infection and the limb is kept sterile afterwards.

In a case of sarcoma of the upper end of the humerus Læwen removed 15 c.m. of the bone and tumor and inserted in its place 15 c.m. of the front of the tibia, which was covered with periosteum. The lower end of the piece of tibia was tapered to fill in the upper end of the lower fragment of the humerus. The upper end of the tibial piece fitted into the joint

capsule. The wound healed kindly and union took place between the bones. There was a recurrence of the tumor, which compelled a shoulder joint amputation. The tissues about the new bone transplant were studied. Blood vessels had traversed the whole part, running through the spongiosa and the Haversian canals, as was shown by the injection of Berlin blue. The individual bone cells were all dead, but new bone was being formed from the periosteum and rested along the outside of the dead bone beneath, which was being slowly resorbed in its lacunæ, where new bone was being substituted. The vascularization at the end of the second month is not surprising, as it has been found even earlier. Barth has seen a bone, transplanted five days before, bleed from a trepanation. By injection Marchand has demonstrated vessels 15 days after transplantation, but this vascularization does not keep the old bone alive. The whole fragment of transplanted bone has either to be absorbed or thrown off as a sequestrum.

For replacing parts of long bones, Lexer has used material that he obtains from amputations, selecting the fresh bone covered with periosteum. The marrow of the transplanted bone causes an inflammation, resulting from its destruction, so it is cleared out and replaced by Mosetig's wax.

Nakahara studied the effects of three kinds of injections. The first was obtained by making a pulp of bone and periosteum from rabbits in blood and salt solution. The second injection was of the proliferating layer of periosteum in defibrinated blood and salt solution. Both these injections were devoid of results, but an emulsion of periosteum, which was made by cutting into fine bits the periosteum of young rabbits and mixing this with salt solution and blood, was successful in subcutaneous and intramuscular injection. Nakahara and Dilger found that periosteum prepared in this latter way, when injected, would form a vigorous proliferation. It was shown that periosteum retains the power of proliferation for some time after death, and the hope is expressed that on the death of a youth periosteum could be procured for an emulsion, which could be kept on hand and be useful as a bloodless treatment for pseudarthrosis. There have been no clinical experiences.

Macewen, in a case of osteomyelitis in a child 3 years old, had to remove the whole shaft of the humerus, and the only reformation of bone was two inches at the upper end, the rest of the shaft remaining frail and useless. Fifteen months later, the condition remained the same, so an opening was made between the muscle where the periosteum should have been, and fresh bone chips, taken from a six year old boy's tibia, some with, but most of them without periosteum, were inserted. The wound healed kindly. Two months later there was new bone where the chips had been put, and union with the upper fragment; at this time similar bone grafts were inserted between the muscles and they also grew. Now, thirty years later, the arm is useful and has increased in length, measuring 11 inches, while the sound humerus measures 14 inches. The increase in length has taken place almost entirely from the proximal epiphysis, although there has been about 1 inch increase in the length where the bone chips were inserted, the whole limb having grown $4\frac{1}{2}$ inches in length in 28 years. In many instances grafting, transplanting, and re-implanting of bone have been practiced successfully by Macewen. He reports another case of a skull injury, which left a defect $2\frac{1}{2}$ inches wide and extending from the left eyebrow to the auriculobregmatic line. The parts of the skull from this defect had been denuded of periosteum and had had dirt ground into them. They were chiseled clean and washed in an

antiseptic solution and placed in the defect, and, despite a partial sloughing of the wound, 11 of the 14 pieces held and healed, thus later completely closing the defect. In another case, a girl of 15 had a rib inserted into the jaw, to replace the half of the horizontal ramus that had been removed years before for disease. The rib was resected subperiosteally and wired to the ascending ramus behind and the mid line in front. One small portion of the transplanted bone came loose, but the jaw is solid. Another case is one of transplanted tibia, which healed soundly and now gives a reliable member. The transplanted portion is much thicker than the other parts of the tibia.

OBITER DICTA FROM FOREIGN JOURNALS.

THE PREVALENCE OF THE OPIUM HABIT IN PERSIA.

In an interesting article entitled "The Opium-eaters and Smokers of Persia," recently published in *La Médecine orientale*, Dr. G. H. Paschayan Khan, of Gez, Persia, states that next to China, Persia holds the palm for the number of opium-eaters. This deplorable habit has already spread throughout Persia. Whether we look for subjects of this vice in the large cities or in the villages, whether we make a statistical survey of the old or young, the rich or poor, the educated or the uneducated, of high functionaries or of street-porters, the fact remains that everyone is a victim to the allurements of the drug. The Persians, by nature intelligent and shrewd, clever and studious, after passing under the engulfing influence of opium, gradually pass into a state of idiocy, on account of a weakening of their mental powers, loss of vivacity and complete undermining of their energy. The majority of the government officials who have this vice pursue it in secret, but despite this precaution everyone in Persia is aware of their being opium-smokers, though the smoking is done only when alone or in the society of intimate friends. Some people of prominence, so as not to be classed with the smokers and not to make public their deplorable weakness, have developed into first-class hypocrites, for though they do abstain from smoking they are not averse to swallowing the drug in pill form. But the greater number of opium-eaters prefer the pleasures derived from smoking to the disagreeable act of swallowing the pills. Besides the secret use of opium, there are other ways of encouraging the use of the drug, as is instanced in the town of Maragha where it is customary for hosts, instead of offering tea or coffee to their guests, to invite them to smoke a pipe that is filled with opium. Oriental hospitality would be greatly at fault, from the point of view of the citizens of Maragha, were this important point in the amenities of life overlooked.

The ordinary opium-smoker is not often content to smoke alone but desires companions, and to find them he frequents public places called Firyak-khans: special cafés favored only by the smokers; or if he wishes to indulge in the habit for any great length of time he goes to the Feramouch-khans, houses set aside for the wooing of all the blandishments of the drug, and which we Westerners would crudely call, opium-joints. In almost all the towns there are Firyak-khans. To form an idea of their number, in Teheran alone there are about 300, each using annually 160 batmans of opium. A batman is equivalent to 5 kilograms in weight, and in the case of opium is valued at 100 francs or \$25.00; therefore the Firyak-khans at Teheran consume annually 195,000 kilograms of opium valued at 5,000,000 francs or \$1,000,000! The class of smokers who do not visit the Firyak-khans consume a like quantity of opium. Hence we can say in all truth that the capital of Persia spends every year 10,000,000 francs or \$5,000,000 on opium.

The Firyak-khans are public establishments with two large rooms, one of which faces the street, the other being in the rear completely cut off

from public view. The opium-smokers, sitting or lying on rugs, busy themselves with their pipes, which consist of a stem of cherry wood about 25 centimeters in length and a bowl of red clay into which is placed a mixture of opium and tobacco. Then the pipe is lit and ere long the smoker inhales the fumes deep down into his lungs. Some drink tea whilst smoking.

This vice is become so much a part of the daily life of the people that the child in utero becomes impregnated with the fumes, for not even during pregnancy would a Persian woman think of desisting from this habit. Often when the child is delivered it is almost moribund. The Persians are not ignorant of the causes which produce this condition, and to revive the child they exercise real Persian ingenuity, since it is the custom to bring the child back to life by blowing opium fumes into its nostrils, and even placing a small quantity of opium in its mouth. And strange to say the child lives!

No Persian can get on for any length of time without his favorite drug, and if circumstances are such that the drug is not forthcoming—even in Persia there are some who are compelled to practice self-denial on account of slender purses!—he grows weak and can no longer continue his usual work, a matter that was quite easy in the palmy days of goodly doses. In fact, his laziness soon passes into a condition of apparent lifelessness, and only when the beneficent drug is again brought in touch with his lips is he awakened from his deep lethargy. What the whip is to certain animals, opium is to the “tired” Persian feeling.

The traveller often encounters in the streets, dervishes and mendicants who, extended at full-length on the ground, are as unconscious as any living person can possibly be. One not acquainted with the peculiar habits of the people would be at a loss to know exactly what to think of the custom of leaving the dead lying in the streets and not taking them at once to some burialground. In reality, tears and sentiment would be wasted, for these apparently dead creatures are biding their time until some kindly person shall place in their hands the wherewithal to buy the much-beloved and greatly-desired drug. And the need of it is not expressed by insistent speech either, as would be the case in other countries where a certain food was desired, but by the whole body: that is to say, the demand is so necessary from the Persian standpoint, that each and every member of the body participates in the cry for the drug. The result is that complete enervation sets in, and when this takes place what more natural than the recumbent position in a public road, where closed eyes and lax limbs are always effective in moving the sympathetic passer-by to pity. In this position they remain for hours, if not for days, until some pitying wayfarer either places a coin in their hands or, what suits their laziness better, places a morsel of opium between their lips. Presto! in a short space of time animation sets in, the eyes are opened, the body is raised from the ground, and, with considerable liveliness, they go their way in search of other good Samaritans, who will not only help them when they are dawdling along at a snail-like pace, but will be willing to place the favorite drug between their lips, when the physical forces are bereft them on account of its continued absence.

CORRESPONDENCE.

PARIS LETTER.

ELIE METCHNIKOFF AND THE PASTEUR INSTITUTE.

By AUGUSTE A. HOUSQUAINS, M. D.

Whether the stranger who comes to Paris be a savant, a biologist, or a physician, he cannot resist the temptation of visiting the Pasteur Institute. Although to-day the doctrines which were started in the Pasteur Laboratory are the property of the entire world, although all the civilized nations are provided with institutions which make a point of studying the science of bacteriology, no one can deny that the Pasteur Institute of Paris has still the prestige and authority which was given it by its founder. Furthermore, it can be said in all truth that there are quite a number of people, besides the savants who have made a study of the biologic sciences, who are attracted by the work done at the Pasteur Institute or by the publications which emanate from it.

The tradition, which was instituted by Louis Pasteur himself, is carefully looked after by his collaborators and the men who have continued his work. Despite the hasty interpretations and redundant deductions which at times accompany the published work of the Pasteur Institute, it can be stated without exaggeration that as a general rule the savants who are in charge of the laboratories make it almost a law to publish only those facts which have resulted from experimentation. But though ever mindful of this, there is no hesitancy on their part to divulge to those who work in the laboratories, the nature of their researches, as well as the stage in which these may be; thus voluntarily furnishing to all the nature of their latest researches.

The management of the Pasteur Institute is under the control of Mr. Roux, who is assisted by Mr. Elie Metchnikoff as sub-director. In the bacteriologic section vaccins, hydrophobia and microbic technique are studied. There is also a special department to which are admitted students who have already mastered the technique; staff officers, foundation students, and interested strangers. This department is presided over by Mr. Metchnikoff and the instructors are MM. Dorel and Mesnil, who impart their knowledge of microbes by means of their personal researches.

The bacteriologic institute has a department for the study of serotherapy, antidiptheritic, antitetanic, antistreptococcic, antitubonic, etc.

Besides the departments already mentioned, there is to be found at the Pasteur Institute a department for the study of biologic chemistry. The preventive and curative serums, the toxins and antitoxins, as they are prepared to-day, are complex in their compositions, and the real

active agent is only a very small part of them; hence, the action of the real agent is probably so weakened by the other substances that in order to study its properties more fully, elimination of the other ingredients of the serum would be necessary. These researches are being prosecuted by Mr. G. Bertrand.

Finally, thanks to the generosity of an anonymous benefactress, the Pasteur Institute was enabled, soon after the communication of Mr. Roux some years ago at Buda Pest concerning the serotherapy of diphtheria, to erect a hospital devoted to the treatment of microbic diseases, containing 250 beds. The hospital is under the management of Mr. Louis Martin.

The foregoing description, condensed though it is, gives a fair idea of the extension of the work of the Institute from the time when, in 1886, a public international subscription, opened at the instigation of the Academy of Sciences, by raising a sum of two and a half million francs (\$500,000) made it possible to transfer the laboratory of Pasteur from its original situation in the garret of the Normal School, where its space was limited to a few square yards, to its present location in the rue Dutot.

Of all those who have continued the work of Pasteur, enriching it with their own discoveries, Elie Metchnikoff is indisputably the most eminent. His researches bear the stamp of originality; they are distinguished by the fact that their philosophic purport is always fulfilled by some practical application. His work on phagocytosis and on immunity gained for him in 1908 a partition of the Nobel prize with Professor Ehrlich.

With a view to ascertaining the present trend of Metchnikoff's labors and researches, I recently visited the Pasteur Institute, where the master kindly gave me for the readers of the *INTERSTATE MEDICAL JOURNAL* the following information.

The studies which resulted in his communication on experimental typhoid fever, recently presented to the Academy of Sciences, have their foundation in his work on the microbes of intestinal putrefaction. These microbes occur in the digestive tract in the form of spores as well as in the vegetative stage of bacteria. During their growth in the intestine the bacilli of putrefaction excrete the products of their metabolism. Contrary to the opinion often expressed, that these microbes are innocuous, Metchnikoff asserts that they are capable of engendering poisons and of exercising a morbid action on the organism. It is by the experimental study of the intestinal flora, then, that we may hope to throw light on diseases of the digestive tract in their entirety; a group of diseases, of which our knowledge is even yet backward, notwithstanding their number and importance. Among the most important of these undoubtedly is infantile diarrhea. To this Metchnikoff devotes his work during the summer months, carrying on his experiments by means of young rabbits. He has also undertaken some investigations into experimental appendicitis in the chimpanzee.

The influence of the intestinal flora on sclerosis and on senescence likewise engages his attention; but the subject which at present most arouses his enthusiasm is the study of experimental typhoid fever. While he has not as yet arrived at any definite conclusions, he tells me that the results so far obtained cause him to hope for the establishment in the near future of facts of practical utility.

And surely the subject is one to rouse enthusiasm. For thirty years since the discovery of the typhoid bacillus made possible great progress in the study of typhoid fever, science has striven to overcome the obstacles to the experimental reproduction of this disease. It is true that

by causing laboratory animals to ingest the typhoid bacillus it has been possible to produce in them a generalized fatal infection, but this infection does not present the essential characters of typhoid fever in man, with its lesions of the intestinal canal.

Under these circumstances it may be asked: Is the typhoid bacillus of itself capable of provoking the disease, or is the association of some auxiliary microbe necessary? Moreover, are the much vaunted methods of curing typhoid by vaccines really capable of effecting this result? Can typhoid fever be treated by serums? And should these serums be antibacterial or antitoxic?

To elucidate these problems Metchnikoff has endeavored to reproduce typhoid fever in the animal most closely allied to the human race, the chimpanzee, by infecting it, not with cultures of the typhoid bacillus, but with the excreta of typhoid patients.

With this end in view, he administered to a young chimpanzee, free from any intestinal or other trouble, fecal matter from a patient at the Hôpital Pasteur, who was suffering from typical typhoid. Before beginning the experiment the fact was determined that this fecal matter contained abundance of easily cultivable typhoid bacilli. For greater surety the virulent material was given to the animal at three different times.

On the seventh day from the beginning of the experiment, the body temperature began to rise and in two days reached the maximum of 40.5° C. (F. 104.9). This febrile condition, however, did not long persist, for two days later the temperature had fallen to 38° C. (F. 100.4). The chimpanzee, which, at the beginning of the experiment, was constipated, was seized with diarrhea during the febrile period.

The experimental disease, which began in a manner closely resembling human typhoid fever, then became complicated. A supervening dysenteric condition ensued, to which the animal succumbed on the thirtieth day from the beginning of the experiment.

Blood from the femoral and the diarrheal matter yielded a pure culture of the typhoid bacillus, strongly agglutinable. At autopsy, eleven raised patches were found in the ileum, resembling the beginning stage of typhoid in the human. They were not ulcerated, but the postcecal glands contained necrotic foci.

Metchnikoff says, in résumé, that the experiment on the chimpanzee shows that the ingestion of human fecal material rich in typhoid bacilli can produce a typhoid fever comparable with that in the human. The investigation of the problems above enumerated is thus rendered possible. Many chimpanzees were shown to me that had been infected in the same manner as the first; their temperature is taken regularly and the results of these researches will be published in due course.

One leaves Metchnikoff's laboratory with a strong sense of conviction that the hope which animates him will ere long be realized; for scientific methods and logical accuracy, not chance or guesswork, dominates his researches, and Metchnikoff has proved in the past that he is the worthy successor of the creator of bacteriology, who illuminated with his genius the horizons of medicine and biology.

DIAGNOSTIC AND THERAPEUTIC NOTES.

THE WASSERMANN REACTION FOR THE GENERAL PRACTITIONER.—E. v. Dungern (*Muench. med. Wochenschr.*, 1910, No. 10). The Wassermann reaction for the diagnosis of syphilis has become of great value not only for establishing the syphilitic origin of the so-called parasymphilitic affections, such as general paresis and tabes dorsalis, but also for the diagnosis of the various secondary and tertiary syphilitic affections with which the practitioner is constantly confronted. It frequently happens that it is of the greatest importance to determine in an obscure case whether the patient has syphilis or not, and a reaction so nearly pathognomonic as that of Wassermann would be in constant use were it not that the difficulty in obtaining the reagents and the skill necessary for their manipulation confined its exercise to professional pathologists and prevented the general practitioner from availing himself of it in other than exceptional cases. Recently, however, the test, chiefly through the work of Noguchi, has been so greatly simplified as to be at the disposal of any one familiar with the ordinary laboratory manipulations. The test depends upon the phenomenon of complement-binding. A complement is a substance found in all fresh blood serum and has the power of dissolving red blood corpuscles. This power can however, be exercised only if the red blood corpuscles have been sensitized by the addition of a so-called immune body. This immune body is obtained from the serum of an animal treated by means of injections of the blood of the other animal whose blood is to be dissolved. For the production of the phenomenon of hemolysis three substances are thus requisite: 1. Red blood corpuscles suspended in physiological salt solution; 2. Serum of an animal containing a suitable immune body; 3. Serum containing complement. The presence of complement in a serum can thus be recognized if hemolysis is produced when it is added to a mixture of immune-body and red corpuscles. If the complement has been destroyed, hemolysis will not occur. Now many substances, chiefly extracts of organs, have the power of absorbing and rendering inert the complement, but so feebly as not to interfere with the reaction. Their power of inactivating complement is enormously increased, however, if they are mixed with the serum of a syphilitic individual. Syphilis can thus be diagnosed if the serum of the patient mixed with, say, an alcoholic extract of guinea-pig heart, when added to the complement-containing serum, destroys the hemolytic power of the latter. As described, the test seems very complicated and, indeed, was so until lately. The recently modified test referred to, however, simplifies the matter greatly. Strips of filter-paper, soaked with guinea-pig serum and dried, furnish the complement in permanent form. As organ-extract, an extract of guinea-pig heart, dissolved in alcohol, is used. The immune-body is contained in the serum of an animal treated with injections of human red blood corpuscles. These three necessary reagents are prepared on a commercial scale by E. Merck's company and have been placed upon the market by them to be sold at a trifling cost. The simplified test is done as follows: Into each of two test tubes place 2 c.c. of physiological salt solution. To

each is added a piece of the complement-containing filter paper and, to one of the tubes, a drop of the alcoholic organ-extract. A little blood is then obtained from the patient's ear or finger, put into a watch-glass and stirred by means of a match until it is defibrinated. A measured quantity of this blood is then put into each test-tube, the latter shaken and set aside for an hour. Thereupon a little immune-serum is added to each test-tube. The reaction takes place within a few minutes. If the patient is syphilitic, the red corpuscles in the test-tube containing organ-extract are agglutinated and sink to the bottom, while the supernatant liquid remains clear. In the other test-tube, the red corpuscles remain suspended and soon become dissolved, forming a bright red solution. If the patient is not syphilitic, the contents of the first test-tube also behave like that of the second one. The test is thus seen to be extremely simple. Noguchi, in over 200 parallel trials, has found this method to be, if anything, more reliable than Wassermann's original procedure.

NUTRIENT SUPPOSITORIES.—Boas (*Berl. klin. Wochenschr.*, 1910, No. 14). The comparative uselessness of nutritive enemata has led Boas to suggest replacing them by nutritive suppositories, consisting of crystallized egg albumin, dextrin, salt and cocoa-butter. If these suppositories are made two and a half inches long and half an inch in diameter, they will contain a little over 46 calories. Four or five of these suppositories can readily be introduced daily, so that the patient receives some 230 calories. This, of course, does not represent a sufficient nourishment, but it is greatly superior to anything that can be attained by means of nutritive enemata. In addition, the necessary water must be supplied by means of two saline enemas daily of a pint each. The suppositories are well tolerated and represent a distinct advance in rectal alimentation. Both crystallized egg-albumin and dextrin are readily obtainable from dealers in chemical supplies.

AN EARLY SIGN IN INTESTINAL OBSTRUCTION. —Wilms (*Munch. med. Wochenschr.*, 1910, No. 5). Leuenberger (*Ibid.*, 1910, No. 14). If the abdomen is auscultated in conditions of active peristalsis, various rumbling and bubbling noises are heard, due chiefly to the bursting of air-bubbles as they rise to the surface of the fluid contents of the bowel. These sounds are, however, usually low-pitched and never have a ringing, metallic character. In ileus, however, even in the earliest stages, auscultation over the abdomen will reveal the presence of sounds of a clear, metallic, ringing character. Wilms, who is chief of the surgical clinic at Basle and commands an enormous operative material, has found this sound pathognomonic of mechanical obstruction of the bowel. It occurs early in the disease, before fecal vomiting, meteorism or prostration has set in, is never absent in real mechanical obstruction, can be readily heard in the most obese patients in whom the early diagnosis of this affection is usually so difficult and with one exception is never found in any other condition. This exception is post-operative meteorism which can usually be otherwise distinguished from true mechanical ileus. His assistant, Leuenberger, has investigated the phenomenon experimentally and finds it due to the bursting of tiny air bubbles in the bowel under conditions resembling those of intestinal obstruction. The sign is clearly a valuable addition to our diagnostic methods.

HISTORICAL NOTES.

DR. LAWRENCE BOHUNE, FIRST PHYSICIAN-GENERAL TO THE COLONY OF VIRGINIA, AND DR. JOHN POTT, HIS SUCCESSOR.*

Of the one hundred and five settlers who reached Jamestown Island on the 13th of May, 1607, after one hundred and forty-six days out from London, Thomas Wotton, William Wilkinson and Post Ginnet were listed as "Chirurgeons," and Thomas Field and John Harford as apothecaries.

Wotton was the fleets' physician, and the first doctor in the American Colonies. His stay in the new world must have been a short one since the ancient archives contain but little regarding him.

The exact date of the arrival of Dr. Lawrence Bohune is not known, but it was within the first half of the year 1610, and he was the first Physician-General of the London Company appointed for service in the colony.

A letter to the Company under date of July 7, 1610, signed by Lord Delaware and the members of the Council, reads in part:

"I only will entreate yee to stand favourable unto us for a new supply in such matters of the two-fold physicke, which both the soules and bodies of our poor people heere stand much in need; the specialties belonging to the one, the phisitions themselves (whom I hope you will be careful to send to us) will bring along with them the peculiarities of the other we have sent herein, inclosed unto us by Mr. Dr. Boone, whose care and industrie for the preservation of our men's lives (assaulted with straunge fluxes and agues), we have just caused to commend unto your noble favours; nor let it, I beseech yee, be passed over as a motion slight and of no moment to furnish us with these things, so much importuning the strength and health of our people, since we have true experience how many men's lives these physicke helps have preserved since our coming in, God so blessing the practise and dilligence of or doctor, whose store is nowe growne thereby to so low an ebb, as we have not above 3 weekes physicall provisions."

The colonists were as yet unacclimated, and much sickness prevailed so that Dr. Bohune's pharmacopeia was enlarged by the use of sundry new vegetables and minerals, rhubarb being found "to be of service in cold and moist bodies for the purginge of fleame and superfluous matter."

Dr. Bohune was a share-holder in the London Company and a member of the General Court which met on January 26, 1619, and February 2, 1620. At the former session he was joint claimant with James Swift for such lands as were patentable to those "who have undertaken to transport to Virginia great multitudes of people with store of cattle," and they gave the number of immigrants so transported by them as three hundred. He subsequently purchased Swift's interest and received an indenture in his own name on November 15, 1620.

At a session of the General Court held on December 13, 1621, it was

*Contributed by Caleb Clarke Magruder, Jr., A. M., LL.D.

ordered: "Mr. Doctor Bohune havinge desired yt hee might be a Phisition generall for the Company according to such conditions as were formerly set downe by way of Articles unto which place they had allotted five hundred acres of land and twenty Tenants to be placed thereuppon att the companies charge, The Court was please to accept of his humble sute for that place and employment and therefore ordered that he should have tenn men provided forthwith to go now with him and tenn more should be sent in this next springe wch. should be transported att the companies charge and furnished as other of the Tennants be, provided that xxtie Tennants being thereon established and made good for one whole year after there Landinge, the said Doctor Bohune do after if any of them die covenant to supply and mayntane from time to time uppon the said land; and att his disease or otherwise surrender of said place, leave the like number of men and stocke and cattle as are by order of Courte to the saide office allowed and appoynted."

The confidence extended to Dr. Bohune in this new precedence seems fully earned, but he was not long spared to enjoy its benefits and honors. Near the end of the year he was again in England arranging for new medical supplies, new colonists, and the introduction of the silk worm into Virginia.

Early in the next year he embarked with 85 immigrants on the *Margaret and John*. At Guadaloupe they took on six Frenchmen, raising the number of passengers, including the crew, to 103 "soules"—men, women and children. While off the West Indies, on March 19, 1621, which they neared to water, they fell in with two large ships who feinted to be Hollanders until they had secured the advantage of position, when they broke the Spanish colors and fired upon the English ships. Nothing daunted by the sheer force of their size and superiority of battery the *Margaret and John* gave battle. Six hours the unequal combat lasted with the most desperate courage on the part of the English, and then—they beat off the enemy with the loss of the latter's captain, making "their skippers run with blood, coloring the sea in their quarter."

These Spanish ships were of 300 and 200 tons displacement mounting 22 and 16 pieces of brass, while the *Margaret and John* was of 150 tons displacement and mounted 8 cast-iron pieces and a small falcon.

In this heroic defence Dr. Bohune fell, while encouraging the crew to resistance. Seven others were killed outright, two died and twenty were wounded. The victory fired the English mind and high tribute was paid the memory of the gallant Bohune.

Purches used the incident in his work, "The Pilgrimes," and Captain John Smith recited an account of it in his History of Virginia. George Deseler wrote of it in Amsterdam, and "Tho. Hothersell, late zityson and groser of London being an I witness an interpreter in this exployte," left a description in manuscript which is still in existence.

DR. JOHN POTT.

On the 13th of June, 1621, the General Court ordered that since creditable information had been received concerning the death of Dr. Bohune, it was thought advisable to name John Pott as his successor in the Council.

Doctor John Pott and his wife Elizabeth sailed on the *George* and landed at Jamestown in 1620, but shortly afterwards returned to England. They were "living at James City and the corporation thereof February 16, 1623."

Having succeeded to the Council upon the death of Dr. Bohune, June 13, 1621, it seems natural that Dr. Pott should covet the former official's

station and emoluments—that of Physician-General to the Colony, with five hundred acres of land and 20 tenants. The minutes of the London Company for the 16th of July, 1621, show that he was recommended for the position by Dr. William Gulston: "For so much as the phisicans place to the company was now become voyde by reason of the untimely death of Dr. Bohune, slain in the fight with two Spanish shippes of Warr the 19th of March last, Dr. Gulstone did now take occasion to recommend unto the company for the said place one Mr. Potts, a Mr. of Artes, well practised in Chirurgerie and Physique, and expert also in distilling of waters, and that he had many other ingenious devices so as he supposed his service would be of great use unto the colony in Virginia."

The Council ordered that "If Mr. Pott would accept of the place upon the same conditions as Dr. Bohune did, he should be entertained and for his better content should be specially recommended to the Governor to be well accommodated and should have a chest of Physique £20 charge unto the company, and all things thereunto apertaining together with £10 in books of Phisique which should always belonge unto the company, which chest of Phisique and Books Dr. Gulstone was desired to by, and seeing he intended to carry over with him his wife a man and a maid they should have their transporte freed, and if one or more Chirurgions could be got they likewise should have their passage freed which conditions Me. Pott having accepted of was referred to the commitees to be further treated and conclude with."

Dr. Theodore Gulstone, graduate of Oxford, died in 1632, bequeathing \$1000 for founding the Gulstonian Chair of Anatomy in the London College of Surgeons, a lectureship which is still continued.

A later entry of the Company's minutes reads: "and for supply of the Physitions place, we have sent you Dr. Pott, with two chirurgeons and a chest of Phisicke and Chirgury; not doubting but you will entertaine and supplye them unto the companies promise give him helpe for the speedy building of a house immediatly upon his arrivall."

Dr. Pott became a member of the Council by royal selection on May 24, 1625, and Governor by election of the Council on March 5, 1628. After little more than a year as chief executive he was succeeded by Sir John Harvey. Hardly had the latter assumed the reins of government before Dr. Pott's enemies sought his disgrace, charging him with having pardoned and restored the privileges of a willful murderer, and with holding some cattle not his own. Harvey confiscated his property and ordered him to remain under arrest at his home until the General Court of July 9, 1630, when he was arraigned before a jury of thirteen on the charge of "felony." The Doctor declared the evidence against him hypocritical and unreliable but the jury found against him. Governor Harvey withheld sentence until he could learn the wishes of the King, writing him that the prisoner "was the only physician in the Colony skilled in epidemical diseases," pleaded for his pardon, and the restoration of his estate because of his lengthy residence and valuable service. Mrs. Pott took ship for England to importune the King in person.

Charles appointed a commission to determine the matter, which reported that the condemning of Dr. Pott "for felony" upon superficial evidence was drastic and very erroneous. The King signed his pardon restoring all rights and privileges on July 25, 1631, most particularly for the reason that he was "the only physician in the Colony."

Dr. Pott, while an educated physician whose ancestors were of the honorable family of the Potts of "Harop," Yorkshire, had no care for

business. He was an epicure inclined to convivial, if not riotous, companionship.

A letter written by George Sandys, translator of Ovid's *Metamorphoses*, dated April 9, 1623, gives us this insight into his personal character: "I have given from time to time the best council I am able, at the first he kept company too much with his inferiors who hung upon him, while his good liquer lasted. After he consorted with ———, a man of no good example, with whom he is gone into Kicotan (Hamp-ton)."

After his pardon by the King Dr. Pott retired from public life and devoted his time to his profession. He had acquired a grant of three acres on Jamestown Island in 1624, which was increased to 12 acres in 1628, but the unhealthiness of the Island drove him inland. In 1632 he purchased a plantation and erected the first home in Middle Plantation, seven miles from James City, which he called "Harop." The fact that the "Surgeon of the Colony" had moved to Middle Plantation was a convincing argument in favor of its healthfulness. Surveys were quickly made and new homes erected so that there grew up around "Harop" a village which was later given the name of Williamsburg, where in 1693 the College of William and Mary was founded under royal patronage.

Williamsburg, first the habitation of Dr. Pott, became the capital of Virginia in 1698, and here her lawmakers assembled until the exigencies of the Revolution made it advisable to transfer the seat of government to Richmond in 1779.

It is not known when Dr. Pott died, but his death probably occurred in Virginia, and certainly after March 25, 1651, at which time his son John, styled Jr., signed the test of fealty to the Commonwealth as a citizen of Northampton County.

BOOK REVIEWS.

THE SURGERY AND PATHOLOGY OF THE THYROID AND PARATHYROID GLANDS. By Albert J. Ochsner, A. M., M. D., LL. D., Professor of Surgery in the Medical Department of the University of Illinois, Chief Surgeon to Augustana Hospital and St. Mary's Hospital, Chicago; and Ralph L. Thompson, A. M., M. D., Professor of Pathology in the St. Louis University School of Medicine, St. Louis. With 57 illustrations in the text and 40 full-page plates, 4 of the plates being in colors. St. Louis: C. V. Mosby Company. 1910. Cloth, \$5.

This book is the fruit of the labors of two men eminently qualified to handle this subject. The part devoted to the Thyroid is the work of Ochsner, with the exception of the chapter on Pathology of the Thyroid, which is written by Thompson, who has written also the section on Parathyroid. In the pathology of Graves' disease Thompson accepts the work of Wilson, who has been able to classify the pathological finding in this condition with the clinical symptoms, and of whose cases eighty per cent. showed a remarkable parallel between the finding in the glands and the condition of the patient. According to the stage of the disease there is a rising increase of functional activity, as shown by increased parenchyma and increased absorbable secretion in the gland. Cases that have been severe here, with remission of symptoms, showed beginning degeneration. The illustrations give the thyroid picture pretty well. The clinical side of thyroid disease is clearly and concisely put, particularly the chapters on the diagnosis of exophthalmic goitre. The non-surgical treatment is briefly considered, as a guide in the non-operative rather than in the operative cases. More than one-half of the patients who have consulted the author in the past 20 years have recovered permanently under non-surgical treatment, but it is doubtful whether such permanency will follow a non-surgical treatment of these cases in countries where exophthalmic goitre is endemic. To Ochsner it seems reasonable to hope that some time a remedy will be introduced to neutralize thoroughly the thyroid poison in the blood. In favorable cases this is accomplished by Forchheimer with quinine hydrobromate, Beebe and Rodgers' serum is spoken of as of value in acute cases with severe symptoms. Anti-thyroidin is mentioned as one of the preparations used in the attempts to neutralize the trouble. Strophanthus, arsenic and belladonna are mentioned as being unreliable. The principal treatment of exophthalmic goitre is rest, and it must be borne in mind that this refers quite as much to mental and emotional as to physical rest.

The most important chapters in the book are those dealing with operations on the thyroid. The dangers of thyroidectomy are much elaborated, and indications for operation are amply considered. In the operative technique originality of methods is emphatically disclaimed, but the operation of thyroidectomy is perfectly described and illustrated; also the other operations about the gland for relief of Graves' disease, and other conditions. The illustrations are very numerous and the plates of the various operative procedures are complete and definite and constitute of themselves an operating atlas, which would be sufficient, even without the excellent text that describes them. There is sound judgment in the discussion of the prognosis of Graves' disease after operation, and sane advice as to the method and time of operation.

Thompson's sections on the Parathyroids are full and complete, and embody the results of his special work on these glands which has made of him an authority on the subject. The relation of tetany to the removal of these glands and the possibility of relief of the condition make the surgeon doubly interested, and the author has given the most complete treatment of the subject from its every aspect.

STUDIES ON IMMUNITY. By Robert Muir, M. D., Professor of Pathology, University of Glasgow, in collaboration with Carl H. Browning, M. D., and William B. M. Martin, M. B., Ch. B. London: Henry Frowde, Hodder & Stoughton; Oxford University Press, Warwick Square, E. C. 1909.

This book is a collection of the papers of the research on immunity carried out in the pathological department of Glasgow University and Glasgow In-

firmly with the aid of grants from the Carnegie Trustees. All this work has been previously published in separate articles. In this book the papers, however, have been arranged to give a continuity to the whole and certain alterations and additions have been made to make it conform with the most recent developments of this subject. It contains chapters on the Properties of Immune-Bodies, on the Properties of Complements and their Modifications, on the Combining Properties of Complements, on the Complementoids and their Combination, on Complementoids in Relation to the Dosage of Complement in Different Media, on the Combining Properties of Complements in Relation to their Toxic Action, on the Action of Complement as Agglutinin, on the Filtration of Serum Complement, on the Properties of Anti-Immune-Bodies, on the Hemolytic Receptors of the Red Corpuscles, on Diviation of Complement and its Relations to the Precipitin Test, on the Bactericidal Action of Normal Serum, and on Complements in General. A perusal of the above subject covered in this work will convince one of the attempt at an exhaustive study of the rapidly growing subject of immunity. Besides giving the author's original work upon the phases of immunity, references are made to most of the other literature which has advanced this subject. The value of the book consists of a scientific effort to clarify and at the same time simplify the general principles of immunity. Endeavors of the author to do this have been fulfilled, and this should meet with the most favorable comment, for the reason that its purpose deals with a subject which should be carefully pursued by all those who are interested in the science of modern medicine.

FRUEHDIAGNOSE UND TUBERKULOSE-IMMUNITÄT UNTER BERUECKSICHTIGUNG DER NEUESTEN FORSCHUNGEN: KONJUNKTIVAL-UND KUTAN-REAKTION, OPSONINE, ETC., SPEZIELL DER THERAPIE UND PROGNOSE DER TUBERKULOSE. EIN LEHRBUCH FÜR AERZTE UND STUDIERENDE. Von Dr. A. Wolff-Eisner, Berlin. Mit einem Vorwort von Geh. Med.-Rat Prof. Dr. H. Senator und Geh. Med.-Rat Prof. Dr. A. Wassermann. Zweite vermehrte Auflage. Wuerzburg: Curt Kabitzsch (A. Stuber's Verlag). 1909.

We are to-day passing through a period of renewed interest in everything that concerns tuberculosis. The good results now being obtained in the treatment of tuberculosis, with and without tuberculin therapy, have increased the importance of an early diagnosis, since it is in the really incipient cases that the best therapeutic results are to be obtained. A book like that of Wolff-Eisner, devoted to a critical review of the various methods for early diagnosis of tuberculosis is thus peculiarly timely. In successive chapters he discusses the methods of physical examination, the clinical laboratory methods and the tuberculin reactions, both general and local. As is to be expected a rather undue amount of emphasis is laid upon those methods originated by Wolff-Eisner himself, such as sputum-cytodiagnosis and the conjunctival tuberculin test; but this will hardly be a drawback to the critical reader. Wolff-Eisner's ingenious though as yet purely speculative theory regarding the mode of action of tuberculin is described at length, and a chapter on the prognostic and social value of the tuberculin reactions closes this very suggestive and interesting book.

PRACTICAL POINTS IN THE USE OF X-RAY AND HIGH-FREQUENCY CURRENTS. By Aspinwall Judd, M. D., formerly Radiologist Post-Graduate Medical School and Hospital; Adj. Professor of Surgery of the Post-Graduate Medical School and Hospital; Consulting Surgeon, St. Vincent's Hospital, Bridgeport; Member of the American Medical Association of the Greater City of New York, etc., etc. New York: Rebman Company, 1123 Broadway.

This book is intended for the general practitioner who, having purchased an electrical equipment, finds himself unable to use the same. It is limited to the care and operation of the apparatus, the use and application of the various rays and currents and the indications for the same. The detail consideration given to this subject and the simple, clear exposition of the subject-matter, should make this little volume a very practical and useful one for all those who use the electro-diagnosis of therapy.

DIE IMPOTENZ DES MANNES. Von Dr. P. Orlowski in Berlin. Zweite Auflage. Mit 22 Abbildungen im Texte und 3 farbigen Tafeln. Wuerzburg: Curt Kabitzsch Verlag. 1909. Preis: Mk. 4.50.

While clearly elucidating all the well-known causes and forms of male impotence, the author of this interesting little volume lays particular stress on changes in the colliculus seminalis. In his opinion they play a rôle of still

unappreciated importance in the etiology of impotence. Orłowski describes in detail these changes, their diagnosis, and the pictures they represent in the cystoscope. Local treatment of the colliculus, according to him, is followed by very satisfactory results. Many of his cases are described in detail.

CONSTIPATION AND ALLIED INTESTINAL DISORDERS. By Arthur F. Hertz, M. A., M. D., Oxon., M. R. C. P., Assistant Physician, Physician in Charge of the Electrical Department and Demonstrator of Morbid Anatomy at Guy's Hospital; formerly Radcliffe traveling fellow of Oxford University. London: Henry Frowde, Hodder and Stoughton; Oxford University Press, Warwick Square, E. C. 1909.

This volume represents the work of three years of research on the physiology and pathology of the movements of the alimentary canal. The preliminary account of this work gained the Radcliffe prize at Oxford University in 1909. Besides giving the views of the personal investigations of the author, the late literature on this subject has been interwoven into the text. More recent aids of investigation, such as the x-ray, etc., have been used to demonstrate accurately intestinal phenomena. It is one of the most up-to-date and advanced texts upon intestinal disorders extant. Although the methods used by the author are available but to the few who have the proper equipment for such work, the book is well worth careful study on account of the remarkable number of new facts, concerning intestinal disorders, with which it abounds.

CONSERVATIVE GYNECOLOGY AND ELECTRO-THERAPEUTICS: A Practical Treatise on the Diseases of Women and Their Treatment by Electricity. By G. Betton Massey, M. D., Attending Surgeon to the American Oncologic Hospital, Philadelphia; Fellow and Ex-President of the American Electro-Therapeutic Association; Member of the American Medical Association, etc. Sixth edition, thoroughly revised. Royal octavo. 462 pages. Illustrated with 12 plates and 15 full-page half-tone plates of photographs taken from nature, and numerous engravings in the text. Bound in extra cloth. Philadelphia: F. A. Davis Company, 1914-16 Cherry Street. Price \$4.00 net.

Specialists and practitioners interested in the question of electric treatment of gynecologic diseases will find in this volume of 462 pages a very exact description of all the various methods of electro-therapeutics applicable to these cases. As is well known, Massey is one of the most enthusiastic believers in the efficacy of the mode of conservative treatment of gynecologic anomalies.

SURGICAL HANDICRAFT: A Manual of Surgical Manipulations. By Walter Pye, F. R. C. S. Fifth edition. Revised and largely rewritten by W. H. Clayton-Greene, B. A., F. R. C. S., etc. 8vo. Pp. 608 with 350 illustrations and plates newly drawn for this edition. New York: E. B. Treat & Co. Price, cloth, prepaid, \$3.

There is more in this little volume than its title indicates, and the great convenience of reference to each detail of the contents makes it a handy and valuable book for any student's or practitioner's desk. Originally it was intended as a guide for surgical assistants in hospitals, and it expressed the best known methods in vogue twenty-five years ago, but the scope of its usefulness has widened, and through its successive editions the modern trend of surgical practice is fully adopted and explained. This fifth edition is in the main built along the lines laid down by Pye. The presentation of each subject is clear and succinct. The book making and printing are good, and the illustrations are well selected and numerous.

TEKA-JARLIBRO 1910. II. vol. Eldonita de la Tutmonda Esperanta Kuracista Asocio. Kum la portreto de la prezidanto de la TEKA. Prof-ro D-ro Henriko Dor-Lyon. Kötzschenbroda-Dresden: H. F. Adolf Thalwitzer. 1910. Brosh. Sm. 0,4 (20 cents), Sn. 0,6 (30 cents).

This is the second year book of the All-World Esperantist Physicians' Association. Besides the usual information pertaining to the Society, it contains articles on Esperanto and the Red Cross, Esperanto medical nomenclature, etc. From the roster we learn that the Society has increased from 428 in 1909 to 628 in 1910. The list includes many well-known names, such as Profs. Dor and Soulier of Lyons, Prof. Vierordt of Tübingen, Prof. Bergonié of Bordeaux, Profs. Bouchard, A. Broca, Gariel, Richet of Paris, etc. Slav and French names seem to predominate; then German. The Anglo-Saxon race seems scantily represented.

THE ESSENTIALS OF MEDICAL ELECTRICITY AND RADIOGRAPHY. By Edward Reginald Morton, M. D., C. M., Trin. Tor., F. R. C. S., Edin. Second edition, pp. 349, 11 plates and 129 illustrations. Chicago Medical Book Company. 1910. Price \$1.75.

The first 210 pages are devoted to the practical application of medical electricity. This section does not present any methods original with the author, but comprehensively and concisely describes the uses of galvanic, faradic, sinesoidal and static electricity, with a few words upon the fulguration treatment of malignancy. The section upon radiography, of 149 pages, is elementary but satisfactory as a practical exposition without theoretical reasoning. It is a good reference hand-book upon the subjects.

HANDBUCH DER GYNAEKOLOGIE. Herausgegeben von J. Veit in Halle. Zweite voellig umgearbeitete Auflage. Vierter Band, zweite Haelfte. Wiesbaden: Verlag von J. F. Bergmann. 1910.

This volume of more than 500 pages is devoted to three important subjects. Veit, the general editor of the work, discusses the diseases of the vulva. Fromme writes most interestingly on peritonitis, devoting a special chapter to peritonitis arising from a diseased appendix during pregnancy or the puerperal state. Menge of Heidelberg concludes the volume with a thorough consideration of the congenital malformations of the female genital organs.

It seems almost superfluous to state again that this work presents the most advanced knowledge of gynecologic disease.

THE PRACTICAL CARE AND FEEDING OF INFANTS. By Mary A. Duns, Graduate of the Woman's Hospital, Chicago, Ill. Chicago Medical Book Co. 1909. Price, \$1.50.

A useful little book, which can be placed safely into the hands of the young mother.

BOOKS RECEIVED.

PRESCRIPTION WRITING AND FORMULARY. By John M. Swan, M. D., Associate Professor of Clinical Medicine, Medico-Chirurgical College of Philadelphia. 32mo. of 185 pages. Philadelphia and London: W. B. Saunders Company, 1910. Flexible leather, \$1.25. Containing six chapters on the principles of prescription writing and an extensive formulary of prescriptions for all the common diseases.

POCKET THERAPEUTICS AND DOSE-BOOK. By Morse Stewart, Jr., B. A., M. D. Fourth edition, rewritten. Small 32mo. of 263 pages. Philadelphia and London: W. B. Saunders Company. 1910. Cloth, \$1.00.

SEX WORSHIP: An Exposition of the Phallic Origin of Religion By Clifford Howard. Chicago: Chicago Medical Book Company. 1909.

HYPNOTISM AND TREATMENT BY SUGGESTION. By J. Milne Bramwell, M. B., C. M. 12mo., cloth, 216 pages. \$1.75; postpaid, \$1.85. New York: Funk & Wagnalls Company. 1910.

THE EXPECTATION OF LIFE OF THE CONSUMPTIVE AFTER SANATORIUM TREATMENT. By Noel Dean Bardwell, M. D., M. R. C. P., F. R. S. (Ed.), Medical Superintendent, King Edward VII. Sanatorium. Edinburgh, Glasgow and London: Henry Frowde and Hodder & Stoughton. 1910. Price \$1.50.

EMERGENCIES OF GENERAL PRACTICE. By Percy Sargent, M. B., B. C. (Cantab.), F. R. C. S., Surgeon to Out-Patients, St. Thomas's Hospital, Surgeon to the National Hospital for the Paralysed and Epileptic, Queen Square; and Alfred E. Russell, M. D., B. S. (Lond.), F. R. C. P., Physician to Out-Patients, St. Thomas's Hospital. London: Henry Frowde, Oxford University Press, Hodder & Stoughton, Warwick Square, E. C. 1910. Price \$5.50.

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INTERSTATE MEDICAL JOURNAL

Books Received—Continued from page 466.

CONSUMPTION—ITS PREVENTION AND HOME TREATMENT. A Guide for the Use of Patients. By H. Hyslop Thomson, M. D., Medical Superintendent, Liverpool Sanatorium. London: Henry Frowde, Oxford University Press, Hodder & Stoughton, Warwick Square, E. C. 1910. Price \$1.00. The volume describes the principles and practices of open-air home treatment and is based on lectures delivered to patients of the Liverpool Sanatorium.

PRACTICAL PATHOLOGY: A Manual for Students and Practitioners. By G. Sims Woodhead, M. A. (Cantab.), M. D. (Edin.), Hon. LL.D. (Toronto), Fellow of the Royal Society, Edinburgh; Professor of Pathology in the University of Cambridge. With 275 colored illustrations. Fourth edition. London: Henry Frowde, Oxford University Press, Hodder & Stoughton, Warwick Square, E. C. 1910.

HANDBUCH DER GYNAEKOLOGIE. Herausgegeben von J. Veit in Halle. Zweite voellig umgearbeitete Auflage. Vierter Band, zweite Haelfte. Mit 83 Abbildungen im Text und 3 Tafeln. Wiesbaden: Verlag von J. F. Bergmann. 1910. Preis: 14 Mk.

MANUAL OF SURGERY. By Alexis Thomson, F. R. C. S., Ed., Professor of Surgery, University of Edinburgh; Surgeon, Edinburgh Royal Infirmary, and Alexander Miles, F. R. C. S., Ed., Surgeon, Edinburgh Royal Infirmary; Surgeon to Leith Hospital. Volume First: General Surgery, third edition, revised and enlarged, with 339 illustrations. Volume Second: Regional Surgery. Third edition, revised and enlarged, with 227 illustrations. Edinburgh, Glasgow and London: Henry Frowde and Hodder & Stoughton. 1909.

THE CONQUEST OF DISEASE THROUGH ANIMAL EXPERIMENTATION. By James Peter Warbasse, M. D., Surgeon to the German Hospital, Brooklyn, New York; Member of the American Medical Association, American Association for the Advancement of Science, etc.; Author of "Medical Sociology." New York and London: D. Appleton & Company. 1910.

LES GREFFES OVARIENNES. Envisagées au point de vue de la pratique chirurgicale. Par le Docteur Louis Sauve. Paris: G. Steinheil, Editeur. 1909.

LEHRBUCH DER ARZNEIMITTELLEHRE, UNTER BESONDERER BERUECKSICHTIGUNG DER DEUTSCHEN UND OESTERREICHISCHEN PHARMAKOPOE. Von Dr. H. v. Tappeiner. Achte, neu bearbeitete Auflage. Leipzig: Verlag von F. C. W. Vogel. 1910. Preis: 8 Mk.

ESSENTIALS OF MEDICAL ELECTRICITY AND RADIOGRAPHY. By Edward Reginald Morton, M. D., C. M. (Trin. Tor.); F. R. C. S. (Edin.), Lecturer on Radiology, West London Post-Graduate College; Medical Officer in charge of the X-Ray Department, West London Hospital; formerly in charge of the Electrical Department, London Hospital, E. Second edition, revised and enlarged. With 11 plates and 129 illustrations. Chicago: Chicago Medical Book Company, Congress and Honore Streets. 1910. Price \$1.75.

A TEXT-BOOK OF PATHOLOGY. By Joseph McFarland, M. D., Professor of Pathology and Bacteriology in the Medico-Chirurgical College of Philadelphia. Second edition. Octavo of 856 pages, with 437 illustrations, some in colors. Philadelphia and London: W. B. Saunders Company. 1910. Cloth, \$5.00; half morocco, \$6.50.

DUODENAL ULCER. By B. G. A. Moynihan, M. S. (London), F. R. C. S., Senior Assistant Surgeon at Leeds General Infirmary, England. Octavo of 379 pages, illustrated. Philadelphia and London: W. B. Saunders Company. 1910. Cloth, \$4.00; half morocco, \$5.50.

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EDITORIAL.

THE ST. LOUIS MEETING OF THE AMERICAN MEDICAL ASSOCIATION.

The St. Louis session of the American Medical Association was a success. Of that there can be no doubt, even although it fell not a little short of the expected numbers in attendance. But even so, it stands third in point of registration at any meeting of the association; and there were certainly between six hundred and a thousand who put in an appearance without displaying the official badge. Had these registered, St. Louis would have been able to claim the second, in place of the third, largest session in the history of the association.

But there are more important matters than mere numbers. The three chief aims of the American Medical Association are the promotion, respectively of medical science, of professional fellowship, and of solidarity in the service of the public and the profession.

The first aim is effected through the section meetings; the second through the entertainments and other opportunities afforded for general social intercourse; and the third through the governing body, the House of Delegates. Looking back over the events of the session, we find that the first and the last of these bodies functionated perfectly and without a hitch, while the drawbacks to the operation of the second lay in two factors entirely beyond control—viz. the distance between the principal hotels, which somewhat lessened the opportunity for social intercourse and amenities out of school hours, that are so eminently possible at, say, Atlantic City; and the weather, which dampened everything except apparently the ardor of the congressists.

To begin with the scientific aspect, all the sections were well attended. Grand Avenue, where were situated within a very narrow compass all the section meeting places, demonstrated this fact remarkably, in that,

during the meetings, it presented its every-day appearance, hardly a convention badge being visible on the streets; whereas, as soon as the sections adjourned, the street resembled an anthill of doctors. Probably the most interesting features of the sections were the symposia on Cancer and Pellagra and the discussion on Hookworm; the first named from all time, the last two of recent years, commanding the earnest attention of the profession. More than 3000 physicians inspected the cases of pellagra that the efforts of the Section on Dermatology had brought together. Symposia on Cancer were held in the Sections on Obstetrics and Diseases of Women, Dermatology, and Pathology and Physiology; while that subject also naturally occupied considerable attention in the shape of individual papers and especially of the Chairman's address, in the Section on Surgery. The joint Symposium on the Circulatory Disorders in Acute Infections, by the Sections in Medicine and in Pharmacology and Therapeutics, was also of considerable interest, and covered a field of special importance to the general practitioner. The meetings of the Section on Ophthalmology also were particularly well attended, the address of Mr. J. Herbert Parsons, of London, on the Effect of Bright Light on the Eyes, being listened to most attentively by a large audience. Under this heading also mention must be made of the exhibits, which at this session included a phase not hitherto represented, viz. that of the history and archaeology of Medicine. The commercial exhibit was noticeable for the preponderance of instruments and appliances for the care of the sick, and for the comparative absence of drug preparations, particularly of those of a proprietary character. The scientific exhibit was of a very high order and it included some excellent displays by physicians, as well as by public institutions. But to the exhibit of the St. Louis Medical History Club must undoubtedly be accorded the palm. It filled an entire room with interesting and valuable specimens of medical books, many of them first editions dating from the renaissance of medicine; a collection of portraits, engravings, diplomas, seals, ancient medical apparatus, and other objects of the utmost value from the viewpoint of the humanistic study of Medicine. That such a collection could have been got together from the resources of the institutions and the profession of St. Louis alone, bears testimony to their cultured character.

As regards professional fellowship, but little can be said of the entertainments and social affairs. Every effort was made to entertain, but unfortunately the weather was so rainy that the private receptions and public outdoor entertainments were seriously interfered with. At the President's reception, however, notwithstanding the inclemency of the night, the line of visitors took two hours to pass, and the subsequent

dance was enjoyed by a large number of guests. The entertainment at Forest Park Highlands, too, was well attended. The general sentiment, indeed, so far as we overheard its expression, was that the visitors had had a "bully good time." It is to be hoped that that sentiment was universal; for certainly that end was most earnestly hoped and labored for by the profession of St. Louis for many months preceding.

Regarding the third aim of the association, it may be said that the distinguishing characteristics of the Sixty-first Annual Session were the insistent appeal for elevation of the profession, and the education of the public in matters relating to public health, and the demonstration of professional solidarity.

The need of the first was shown, not only by the reports of the Council on Medical Education, but even more emphatically by the publication, which took place simultaneously, of the report by Mr. Flexner and Dr. Pritchett on behalf of the Carnegie Foundation for the Advancement of Teaching; that of the second, by the endorsement of legislation to create a national Department of Public Health, whose secretary should hold cabinet rank and not be subordinated to some other department; and also by the creation of a Council of Health and Public Instruction; while professional solidarity was demonstrated by the overwhelming support given to the administration of the Association. Of the proceedings of the House of Delegates continuous personal attendance during the entire sessions enables us to say that they were orderly, progressive, and unanimous. The reiterated promises of explosive fulminations failed of fulfillment, and business proceeded throughout in a methodical and expeditious, yet deliberate, manner that would do credit to any governing body. The unanimous re-election of Dr. Simmons to the post of secretary, which he resigned at the beginning of the meeting, without the expression of a single dissenting opinion to voice the murmurs of dissatisfaction and discord that have for some time past been making themselves noisily heard from isolated points, is incomprehensible if these murmurs represent, as it is asserted, a widespread and deep-rooted dissatisfaction with the existing order of things. In such a case it was surely to be expected that at least some of the delegates representing disaffected districts should have put their sentiments on record. Yet after the renomination of Dr. Simmons had been seconded by six or seven delegates, it was acclaimed by a rising vote in a full house in which not a single delegate remained seated. Since each of these delegates must justify his action to the constituent body which he represents, it is only reasonably fair to assume that his action was in accord with the sentiments of an emphatic majority of his constituents. The logical deduction is, that the attitude of the majority in every constituent body

of the American Medical Association is, without exception, decidedly in harmony with the general conduct of the association and its officers, and that such dissatisfaction as exists, over how ever wide a territory it may be scattered, and however loudly the disaffected may declaim, has no firm hold on the minds of the majority anywhere. Thus was the claim to organic solidarity of the American Medical Association as representing the medical profession of this country in its aims and undertakings abundantly justified.

THE DUTY OF PUBLISHING.

It seems remarkable that it should be necessary to call attention to the necessity of publishing scientific investigations, now that current literature is of such enormous extent; yet that is the preachment of A. J. Humphreys in *Science*. Every little while it is found that an epoch-making study or theory has been buried many years in the proceedings of some local society and resurrected only after the facts have been rediscovered. Such instances are used to prove the justice of the complaint that research workers do not give sufficient publicity to their results, though as a matter of fact it is all due to the comparative obscurity of the pioneer. We give little attention to men until they become famous and as they do not attain distinction until they have added something notable to the world's stock of knowledge, it is almost the rule for them to suffer early neglect simply because they are not famous. Moreover, some of the greatest discoveries have been rejected by the prominent scientific periodicals by reason of the obscurity of the authors or the stupidity of the orthodox authorities. So often does this happen that it is now rather accepted as a rule that a new idea which causes a change in current theories must fight for its existence or lie dormant until an authority takes it up anew. The fault is not with the workers in the vineyard, but with the middlemen who hawk the produce.

The pressing need of science, in general, is some kind of a clearing house or central office where every conceivable kind of addition to the world's knowledge, shall be boiled down and epitomized and thus made available for those who are too busy to dig out the articles themselves. Indeed in each separate field it is utterly impossible for even the specialist to keep up with the enormous additions to practical matters in every language. He must depend upon translations and condensations, but no one man can furnish these and thus it happens that important discoveries are not known for some time. How much more difficult then it is for us to

get prompt information of new facts in some sphere quite different from our own. It seems as though individual effort is now wholly out of the question, and—a research worker must associate himself with other specialists to do “team-work.” The minute division of labor of advancing civilization is thus gradually bringing us back to primitive conditions, with this difference—the investigator is now a group of workers or several groups acting as a unit, very many brains contributing to the product.

There is no doubt that all the special sciences dealing with mankind, such as sociology, anthropology and pathology, have been seriously retarded in their development by the specialization which has kept the workers in ignorance of laws known to every biologist. The old style naturalist made generalizations of tremendous importance and then buried the facts in some obscure “proceedings” of a little local society.

The inevitable result is the host of absurd sociological hypotheses which would never have been promulgated if it were known that they were contrary to nature.

All this applies to medicine in a double sense. Every natural science is producing something every year of vital importance to us both theoretically and practically, and on the other hand we are making advances which should be put to practical use by non-medical workers. No physician who does not keep in touch with the whole scientific world is doing his best, and he has a reciprocal duty to give others the benefit of his experience. Unhappily there are no periodicals he can read to furnish him with the required synopses, and lack of time utterly prohibits the reading of technical journals other than those of his own sphere. The outlook is not hopeless, nevertheless, for there is apparent a tendency to organize some kind of a clearing house whereby new things can be made available to the busy medical practitioner. We have repeatedly called attention to the immense amount of valuable knowledge gleaned by the general practitioner who thinks he is unable to put it into shape for publication, and it is well known that medicine is greatly injured by its inability to get possession of these hoarded piles of wealth. But the new view of the duty of publishing is to make our knowledge available for lay scientists and thus we hark back to the old musty discussions of how far it is ethical to go in the way of resorting to lay publications. There is no doubt a vast preponderance of professional opinion to the effect that physicians should confine themselves exclusively to technical journals so that their efforts may receive skilled editorial revision to prevent the publication of manifest errors. It is this very condition which enhances the value of papers and gives them almost the status of official accuracy. It would be folly therefore to cut loose entirely from a system whose very conservatism acts as a regulator and prevents us running after false gods. Too often do we find that bizarre theories rejected by standard journals and subsequently exploited in the sensational lay press, have proved false and harmful.

The real need is a system of giving exact information of accepted

theories and new facts in such shape that the outsider can grasp them and use them in his own sphere. Huxley was a past-master of the art of popularizing real science and the good he accomplished cannot be calculated. The medical world is under an everlasting debt to that wonderful man, and we are openly accused of failure to pay the debt by reciprocating. These bitter taunts as to our clannishness are no doubt at the basis of the increasing tendency of medical leaders to take the public into their confidence—not only the general scientific public, but every one interested in health and disease—which means every one having some sense beyond the mere fight for dollars. The tremendous concentrations of population cannot be maintained without great and expensive sanitary appliances but the money will not be appropriated unless the public at large is convinced of the necessity. It is, therefore, essential to popularize sanitation, and we have also long acted upon the need of disseminating hygienic facts, but the leaders are now showing a marked tendency to popularize medical matters hitherto confined to technical language in technical periodicals, as though the men most interested had the least interest. If one of a family is stricken with tuberculosis surely the rest are vitally interested in finding out the causes and avoiding them. To be sure, the family physician is there to guide and instruct, but there is a demand for more knowledge than he can find time to impart and many have no medical adviser. The various public health crusades are the consequence of the old system, and popularization of medical knowledge is part and parcel of the new order of things. It would be folly to touch upon matters which have not been thoroughly thrashed over in medical journals, so that the new articles are invariably on questions so long settled that no technical journal would weary its readers by giving them space.

There is the danger, of course, that inexperienced or badly balanced physicians will rush into print for other reasons than the altruistic one of improving public health. It will also be inevitable that some who have had no ulterior motive will be accused of notoriety seeking, but this is always the penalty of public service and must be accepted. Luckily there are physicians not in practice who are above criticism and they will probably be the ones upon whom the burden should fall. What more noble avocation can be imagined than that of working for public health! Surely the rewards in the way of public commendation are enough to tempt the retired physician into the light of publicity. So let the new crusade of public education go on with increased efficiency. The time is coming when most babies will have a good chance of living useful lives instead of being cut off in childhood, but it will be a long distance ahead unless the medical profession wakes up to its duty of public service of one kind or another. We have too long been giving our services free to cure those who should not have become sick—now let us prevent the diseases by spending equal time and energy in another direction. One of these duties is that of publishing everything of value to the profession or laity.

OPINION AND CRITICISM.

THE CARNEGIE FOUNDATION REPORT.

The publication of the report of Mr. Abraham Flexner and Dr. Henry S. Pritchett on Medical Education in the United States and Canada, made to the Carnegie Foundation for the Advancement of Teaching, at the time of the American Medical Association's session in St. Louis, undoubtedly created not a little of a sensation. It was, of course, immediately assailed because of its conclusions, obviously without any adequate knowledge of the data on which those conclusions were based, inasmuch as the report, which lies before us, could not possibly have been mastered in a few hours. As a matter of fact it is one of the most thorough investigations into any subject that we have ever read, and we say this after a careful and painstaking perusal.

The exceptions taken by its critics, who rushed into print within twenty-four hours of the appearance of the Report, may be divided into two classes: first the usual resort, as embodied in the acute advice of the worldly wise lawyer, "in a weak case, abuse the other side's attorney;" and, secondly, the meeting of specific charges by a general denial on *a priori* grounds. For instance, several critics gravely informed us that the report could not be of any account because Mr. Flexner is not a physician, and therefore is entirely unfitted to judge of medical teaching. The answer to this is, of course, simple. Medical teaching is a branch not of medicine but of teaching. It is not medicine considered in relation to teaching, but on the contrary teaching considered in relation to medicine. The investigator, therefore, ought to be, as Mr. Flexner is, an educator who has familiarized himself with the requirements of medicine, rather than a physician who tries to familiarize himself with the requirements of teaching. It is not the matter but the manner of teaching that is to be considered, and in that, the professional educator, other things being equal, has an advantage over the mere teacher of a given subject who is more often chosen unfortunately for his knowledge, or supposed knowledge, of the subject than for his knowledge of the methods of imparting that knowledge to others. Moreover, it is not to be supposed that Mr. Flexner failed to avail himself of the assistance of medical teachers in his investigations, for he has medical connections of the highest standing. Finally the remarkable concurrence of results with those obtained simultaneously by the Council on Medical Education of the American

Medical Association testifies to both the accuracy of the data detailed in the report and the correctness of the conclusions drawn therefrom.

The second class of objection is even more puerile. It is as though one confronted with the evidence that he was seen to take a purse from another's pocket and was found spending the money and with the actual purse in his possession, should reply that he had plenty of money of his own and had no need to steal, and moreover that his character was above suspicion.

The medical profession at large, we imagine, will hardly be convinced on such a weak defense as this that the strictures in this report are undeserved.

The only other answer to the tenor of this report lies in the argument that it is necessary in the interests of the "poor boy," who may have a natural inclination, and by inference, a natural aptitude for the practice of medicine, that he should not be met by a closed gate at the very threshold of his career; that poor districts as well as rich ones need medical aid, and that the more expensively trained and highly cultured physician will not be attracted by the meagre financial returns and the culturally deficient environment of the more remote and less favored districts of the land. Here the authors have anticipated the critics by showing conclusively, (1) that generally speaking, the "poor boy" who does get through owing to the lax requirements of certain schools, so far from returning, as a rule, to practice in the remote fields with whose (supposedly) more meagre returns he is more content than his better equipped confrère would be, and where from his early environment he is more likely to feel less keenly the defects in culture as a fact tends to crowd into the larger cities, which offer these supposedly better financial returns and cultured advantages, and in so doing lessens the general ethical standard of the profession; (2) that leaving aside the services, missionary work, and other careers which, in spite of their poor returns and accompanying hardships, do attract often the very best class of physicians, very many instances can be adduced of men of the highest training settling in remote small country communities, scantily populated and offering but little in the way of cultured attractiveness; and finally that the actual cost in the long run of the best training at many of the highest class schools, is not in excess of what is actually paid by the "poor boy" at the schools of much lower calibre. As the authors say "it is clear that the poor boy has no right to go into any profession for which he is not willing to obtain an adequate preparation; but the facts set forth in this report make it evident that this argument is insincere, and that the excuse which has hitherto been put forward in the name of the poor boy is in reality an argument in behalf of the poor medical school."

Perhaps not the least ill effect of the overproduction of ill-equipped medical practitioners is that pointed to in the following words: "The organization of medical education in this country has hitherto been such as not only to commercialize the process of education itself, but also to

obscure in the minds of the public any discrimination between the well-trained physician and the physician who has had no adequate training whatsoever" (italics ours). From this to the running after every kind of quackery is but a short step; and there is probably not a country in the world where charlatanry of every kind is more rife and more profitable than the United States. To discuss this work in detail would of itself require a volume. Suffice it to say that the report is divided into two parts, the first of which discusses the history of medical education in this country (as a necessary preliminary to what follows), and then considers in detail the basis of education, proper and actual, the course of study, the financial aspects, and finally the proposed method of reconstruction of medical education so as to bring it further into line with modern ideals. This reconstruction is based on a reduction of our present 155 medical schools to 31, all connected with universities, not by a loose "affiliation" but as an integral part of the university deriving support from it and answerable to it for its efficiency. The authors thus conclude their consideration of this part of the subject: "The right of the state to deal with the entire subject in its own interest can assuredly not be gainsaid. The physician is a social instrument. * * * * As disease has consequences that immediately go beyond the individual specifically affected, society is bound to protect itself against unnecessary spread of loss or danger. * * * * Practically the medical school is a public service corporation. It is chartered by the state; it utilizes public hospitals on the ground of the social nature of its service. The medical school cannot then escape social criticism and regulation. It was left to itself while society knew no better. But civilization consists in the legal registration of gains won by science and experience; and science and experience have together established the terms upon which medicine can be most useful."

We regret that space does not permit of any reference to the sections on the medical sects, the state boards, the post-graduate school, the medical education of women and the medical education of the negro. All are full of interest.

The second part is taken up with a detailed report, arranged by states, on every medical school in the country, including the "osteopathic" establishments; for, as the authors say, "the law may require that all practitioners of the healing art comply with a rigidly enforced preliminary educational standard; that every school possess the requisite facilities; that every licensed physician demonstrate a practical knowledge of the body and its affections. To these terms no reasonable person can object; the good sense of society can enforce them upon reasonable and unreasonable alike. From medical sects that can live on these conditions, the public will suffer little more harm than it is destined to suffer anyhow from the necessary incompleteness of human knowledge and the necessary defects of human skill."

In conclusion, it is surely not too much to say that the Report on

Medical Education in the United States and Canada to the Carnegie Foundation is the greatest step in advance toward the elevation of the healing art to the level of comparative perfection attained by the arts founded on other sciences, that has yet been made.

LITERARY NOTE.

"The Spirit of Youth and the City Streets" is Miss Jane Addams's most recent contribution to the special field of endeavor in which, for a number of years, she has worked with conspicuous success. The superficial person, as he walks along the rather uninteresting streets in our American cities, pays scant attention to the attractions which are temptingly set forth to lure the young and inexperienced; but according to the philosophic mind of Miss Addams there is enough and to spare in the temptations up and down our thoroughfares to give us pause when the mood is upon us to inquire into their evil effects. Medicine in its broader aspects is to-day interested, not only in preventable diseases, but also in the improvement of the moral status of all those beings in our large cities who need the guiding hand of some initiated person to warn and to advise; and that some sort of reform should be instituted to abolish the dance halls and the sensational moving pictures in the five-cent theaters is a matter that should invite just as much attention from the physicians as from the sociologists. No more effective writing on these subjects could be demanded by the sternest critic than can be found in Miss Addams's book; and by "effective" we do not mean an exaggerated and too highly colored style, but the manner of using words so that upon them shall be the imprint of the student and the humanitarian. The chapter, *The House of Dreams*, may be singled out as a very good illustration of what we mean, but by calling attention to this one chapter we do not mean to detract from the others. In truth, every word in this book has a meaning, and he who arises from its perusal without a better stimulus for looking into certain matters which were neglected through inadvertence must surely be a dullard.

ORIGINAL ARTICLES.

THE DIAGNOSIS OF MITRAL STENOSIS.

By JOSEPH M. PATTON, M. D., of Chicago.

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The diagnosis of mitral stenosis is not so trite a subject as most of our text books would indicate. There is, perhaps, no other valvular lesion so often overlooked as mitral constriction. This is not surprising in view of the fact that the most classic of the symptoms of stenosis of the mitral opening are more or less inconstant or evanescent.

Provided that the cardinal symptoms—presystolic murmur, thrill, systolic shock, intensification of the second pulmonic sound and moderate lateral displacement of the apex beats—are present, the diagnosis of no valvular lesion is easier or more certain. But in the absence or indefinite presence of most or all of these indications there is no valvular lesion the definite recognition of which is more uncertain.

There are certain general features associated with mitral stenosis which we are prone to neglect in our habit of going direct to the heart itself for diagnostic indications.

The so-called mitral facies is supposed to consist of a flush on the cheeks presenting every grade from slight duskeness to actual cyanosis, except in advanced stages of the disease or when acute dilatation of the left auricle has supervened when this condition is not usually present. Petit has called attention to mitral stenosis in chlorotic young women, in whom pallor of the skin, pale mucous membranes, dyspnea, palpitation, constipation, menstrual irregularities, and various nervous manifestations are characteristic of the disease. Between these two extremes we have the more common condition, as represented by a woman of 25 or 30 years, an age when these patients are very likely to report with symptoms of a lesion which itself dates back to childhood or early adolescence. The patient is under weight, thin, anemic, pale; with clear conjunctivæ, short respiration jerky in character, nervous and irritable manner. There is usually a slight icteroid tinge to the skin which is quite characteristic of these patients. It is possible to walk through the women's ward of a general hospital and pick out, by their general appearance, patients with mitral stenosis.

Dyspnea, one of the distressing features of the advanced stages of mitral stenosis, is often a feature of diagnostic importance. In the prehypostolic period of the disease. Before pressure alterations in the lesser circuit and in the bronchial arteries have instituted the changes which may result in catarrh, congestion, hemorrhage, or edema, we find dyspnea induced by slight exertion, especially walking against the wind; while paroxysmal dyspnea occurs from nervous excitement, apprehension, stomach or bowel disturbances or even constipation. These attacks of paroxysmal dyspnea have been attributed to cardiac asthma. They are always marked by an irregular heart action, and inability of the left auricle to empty itself is probably the direct cause of the dyspnea, and in some instances, at least, the prompt relief afforded by bromides would indicate that the sequence of these events arises from nervous disturbance.

Pain, generally considered to be an insignificant feature of mitral stenosis, is rather frequent, and, so far as its evanescent nature and recurrent character are concerned, is rather characteristic of the lesion. It is usually confined to the precordial region and may be quite sharp, though usually transient. It comes and goes without apparent reason, and is most likely to be present when the heart is irregular. Rarely the pain radiates to the shoulder or to the other side of the chest. It seldom resembles the pain of angina pectoris, though, when the latter is associated with mitral stenosis, the beginning of the attack may mislead one. Precordial pain is often associated with functional disturbance of the stomach in mitral stenosis, and is frequently accompanied by an irregular pulse. The pain may be referred to the back between the shoulders. Such stomach disturbance and pain may be symptoms of gall-stones, the relative frequency of which in association with mitral stenosis has been noted by Brockbank.

The pulse, generally described as of low pressure and "perfectly regular and quite equal" (Gibson), except in the later stages, is often very indicative of mitral stenosis, entirely aside from conditions of cardiac incompetency. The striking peculiarity of the pulse is its tendency to irregularity, and to rapid variations between perfect regularity and an ataxic condition resembling that of interstitial myocarditis. These rhythmic changes in the pulse are especially liable to occur from reflex, psychic, or nervous disturbances and to be entirely independent of the dynamic condition of the heart itself. The pulse has a peculiar jerky rap to the percussion stroke, which is not entirely lost, no matter how low the pressure may be. The sphygmogram does not convey a corresponding difference between the pulse of mitral stenosis and certain myocardial conditions marked by arrhythmic features. Leube describes the pulse of mitral stenosis as "more irregular than any other valvular lesion," and attributes this action to inefficient function of the left ventricle and insufficient filling of the coronary arteries. However we may regard the necessity for purely physical reasons for the irregularity of the pulse in mitral stenosis, we must admit that in many instances they cannot be

invoked in explanation, and we must allow the potency of psychic and reflex influences in causing irregularity of the pulse in association with this lesion.

The area of cardiac dullness and the position of the apex impulse are most important in the diagnosis of mitral stenosis, and especially so in determining the presence of an uncomplicated stenosis. The transverse area of dullness may be increased from one-half inch on the right of the sternum to the left mammillary line, and yet the apex will present in the fifth interspace, or in children, even in the fourth interspace. This relative elevation of the apex impulse, in relation to the transverse increase in dullness is quite characteristic of mitral stenosis.

Over the left auricle dullness on deep percussion may extend as high as the second rib if the auricle is much dilated. The observations of Samways lead him to believe that while auricular hypertrophy is an early result of mitral stenosis, dilatation is mainly a break-down phenomenon. Undoubtedly, in moderate stenosis the left auricle is not at all dilated, but in moderately severe stenosis it may be sufficiently dilated to become evident on physical examination. The deep position of the auricle, however, renders its enlargement of little diagnostic importance, except as evidence of severe or advanced stenosis. The important point is the apex position in relation to the extent of the transverse dullness. This becomes minimized, of course, in those instances where there is considerable enlargement of the left ventricle, either from back pressure in the general venous system, such as when compensatory to interference with the aspiratory action of the left ventricle (Giuffr ), or as the result of concomitant myocarditis.

According to Riegel, the right ventricle hypertrophies according to the degree of resistance to be overcome, and this primarily without dilatation. Krehl maintains that infectious nox  of the myocardium account for some of the alterations in the heart. According to Leube, the left ventricle shows concentric atrophy in pure mitral stenosis when the left auricle does not compensate fully, but only in the early stages and in lesser degrees of stenosis.

The important features on palpation are: the diffuse cardiac impulse, the systolic apical shock, impulse to the right of the sternum and about the epigastric notch, systolic impulse over base to left of sternum, and diastolic impulse over semilunar valve. Though the cardiac impulse may be feeble there is a sudden short rap of the immediate apex impulse, which, even though weak, is quite characteristic of mitral stenosis. The impulse over the auricle, which Osler maintains to be in every instance due to dilatation of the conus arteriosus, may, in rare instances, be due to the auricle, and is then distinctly presystolic in its relation to the systole of the ventricle, and the difference in time of the two may be recognized by palpation. The impulse over the semilunar valves is, at times, quite evident and is important from a diagnostic point.

Much has been written about the length and time of the characteristic

thrill of mitral stenosis. It is not necessary to discuss these features in detail, but once familiar with the thrill of stenosis it will not be mistaken for anything else. There may be a thrill at the apex in aortic regurgitation, and sometimes with contact of an enlarged heart against the chest wall, but the mitral thrill is, as Rolleston points out, intercostal, and while it is very changeable as to time, character, and constancy, its exceedingly fine, vibratory character, its relation to some part of the diastolic period, usually the end, presystolic, and its abrupt termination in the systolic shock of the apex impulse, identify it as a thrill which, while sometimes absent in mitral stenosis, is never present in any other valvular lesion.

More dependence is placed on the murmur for diagnostic purposes, as a rule, than on any other feature of mitral stenosis. This is natural, as the murmur is the most easily appreciated of the cardinal symptoms of this condition, and while the murmur is variable it is yet more constant than the thrill. It is not necessary for a diagnosis, and in most instances it should be possible to reach definite conclusions without it. Balfour considers that the area of heart dullness, position of apex beat, an intensified second pulmonic sound, and the systolic shock, are sufficient for a diagnosis in the absence of a murmur or thrill. Leube states that right ventricular hypertrophy, intensified second pulmonic sound, and synchronously weak pulse, indicate mitral stenosis in the absence of a murmur.

In the absence of murmur or thrill the most important points are the position of the apex beat in relation to the extent of transverse cardiac dullness, the apical shock, the intensification of the second pulmonic sound, and a weak and, frequently, irregular pulse. The usual features of the murmur have been much discussed and need not be reiterated here. The physical changes in the mitral cusps in stenosis differ so greatly that we need not be surprised at a wide variation in the character of the murmur. It may start directly at the beginning of diastole (Leube), and, if the pressure be low, may not be heard till the end of diastole when the auricular force becomes evident; or, it may be initially diastolic, then a pause, then a presystolic end murmur (Fratzel's "interrupted, modified, diastolic" murmur).

A delayed mitral regurgitant murmur, delayed because moderate dilatation of the left ventricle may relax the mitral ring and render the valves unable to withstand the full force of the systolic pressure, may be mistaken for stenosis, because the first sound of the heart being heard before the murmur produces a rhythm similar to the triple rhythm of stenosis.

A presystolic murmur may be heard in aortic regurgitation, and also in adherent pericardium. It may be best heard in these conditions at the apex, but is usually more apparent to the right of the apex and is not so limited in area as the murmur of mitral stenosis. It is of a different character and does not end so abruptly in the first sound as the murmur of stenosis does. The so-called Flint murmur, which is usually presystolic

and due to ventricular dilatation preventing the anterior mitral flap from approximating the wall of the ventricle during diastole, may resemble the murmur of mitral stenosis in time, but not in character, and is not accompanied by other signs of stenosis. Moreover, the causative dilatation of the ventricle is not usually consistent with the factors of mitral stenosis.

The first sound of the heart at the apex is unusually loud, clear, sharp, and short in mitral stenosis. It has an abrupt, jerky character. The loud element of the first sound has been explained as due to forcible closure of the tricuspid valve by a greatly hypertrophied left ventricle (Sansom), and also attributed to the feeble contraction of a partly filled left ventricle (Broadbent). It can sometimes be heard without applying the ear to the chest wall. Its explanation is difficult. The second sound is relatively much more indistinct at the apex, though clear and sharp at times.

Accentuation of the second sound over the pulmonic area is a marked and constant feature of mitral stenosis. It is more constant, though variable in force, than in any other condition involving increased pressure in the pulmonary circuit, except combined lesion of the mitral valves. The sound becomes ringing and high pitched with dilatation of the left auricle or weakening of the left ventricle. Leube considers the character of the intensification of the second pulmonic sound as of great importance in the diagnosis of combined lesions of the mitral. Doubling of the second sound at the base is of common occurrence in mitral stenosis. This was originally described by Bouillaud, while Potain was the first to ascribe it to difference in pressure in the aorta and pulmonary arteries. Physiologic doubling occurs at the end of inspiration, and chronic arterial or kidney disease may cause it. In mitral stenosis the duplication of the sound is due to the fact that the right ventricle takes a longer time to terminate its systole (Barr), the closure of the pulmonary valves occurring therefore later than the aortic. According to Geigel the over dilated, less elastic pulmonary artery retracts later than the poorly filled aorta.

An apparent doubling of the second sound is sometimes heard at the apex in mitral stenosis. It is difficult to explain, but Sansom attributes it to a change in the tension of the mitral cusps during the first part of the diastole when the auricular blood entering the ventricle with some force causes the mitral valve to bulge, producing a sound which follows the second sound of the heart, thus causing apparent doubling, an explanation that is similar to that given for the Flint murmur.

In differentiating combined lesions at the mitral opening we must remember that all the general conditions indicating involvement of the general and the pulmonary circuits are more severe and are earlier apparent in a double lesion than in a single one. The heart becomes irregular earlier and more persistently. The first sound is always rough, even if there is no murmur, and the second is more markedly and persistently intensified over the pulmonary valve. The association of mitral lesions is so common that Leube asserts that the diagnosis of simple mitral re-

gurgitation should never be made unless mitral stenosis can be positively excluded. It seems to me, however, that doubt is more likely to occur in trying to exclude mitral regurgitation in association with mitral stenosis.

In the diagnosis of associated lesions the percentage of error increases rapidly with multiplicity of lesions. In a recent case a woman entered the hospital with a diagnosis of double mitral lesion. Shortly after her admission I found also signs of a double aortic affair. The interne was sure the latter was not evident on her admission. A few days later the aortic signs were very much more pronounced, and, as she was showing a rise of temperature, a diagnosis of probable acute infective aortic valvulitis engrafted on a chronic endocarditis, was made. A blood culture showed a Gram negative organism which was not definitely identified. Autopsy showed marked stenoses of the aortic, mitral, and tricuspid openings. There were marked, recent vegetations on the aortic valves with a considerable ulceration of one leaflet. The diagnosis, so far as it went, was correct, but the wide distribution of the various left-sided murmurs and their sufficient causative relation as factors in the production of the enlargement of all the cavities of the heart caused us to overlook entirely the possibility of the tricuspid lesion.

In spite of the most careful analysis of symptoms we may, in occasional instances, overlook the presence of mitral stenosis, while in others there will be a well balanced doubt as to its presence or absence; but usually a careful consideration of the indications outlined here will enable us to reach a definite conclusion, which is most essential to determine the nature of our therapeutic measures and the results to be obtained from them.

A PRELIMINARY STUDY OF THE POISONOUS SCORPION,
INCLUDING A REVIEW OF SOME RECENT LITERA-
TURE AND PERSONAL EXPERIENCES.*

By H. V. JACKSON, M. D., of Durango, Dgo., Mexico.

My attention was first called about 1887 to the subject of poisonous scorpions and the results of their stings, in the Gila Valley, in southern Arizona, when I observed two resulting deaths among children under six years of age, and one death in a woman of 22 years.

At that period I was stung several times and personally experienced the symptoms in various degrees, depending in severity on the location of the sting.

In 1897, I removed to Durango, Mexico, a place long famous as the home of a particularly poisonous variety of this arachnid, and naturally continued to be interested in the subject.

There are a number of varieties of scorpions existing in the vicinity of Durango, but the only one whose sting frequently causes fatal results is a light colored, long tailed scorpion, a specimen of which I sent to the Bureau of Entomology at Washington, D. C., and it was there classified as the "*Centrurus exilicauda*, Wood."

Professor Ochoterena assures me that according to Blanchard the same variety was described by Latreille during the French occupation, as the *Centrurus gracilis*. It is much lighter in color than the other varieties, averages about 50 millimeters in length, of which about 22 correspond to the preabdomen; the head is united to the thorax forming a quadrangular body, in which are found eight eyes divided into three groups, two of the three small ones being situated at the sides and above, and another of two larger ones found about three millimeters from where the head begins.

This disposition of the eyes permits the scorpion to see in diverse directions at the same time without making the least movement.

The preabdomen commences with a wide part of approximately six millimeters formed by seven rings, which show at the sides of the middle line some coffee-colored semi-lunar ornaments; the last segment is conical, much more elongated than the preceding ones, and is succeeded by the postabdomen.

The finding of fossil scorpions in which the preabdomen was insensibly continued into the postabdomen has proved that the last part is not a tail.

*Read before the International Medical Association, at Aguascalientes, January 26th, 1910.

The postabdomen consists of six segments, which in this species are longer than in other varieties with which I am acquainted, and terminates in a segment provided with a curved, needle-like stinger and two poison glands which are connected with lateral orifices close to the point of the stinger where the poison is expelled.

In the cephalous thorax there exist the following appendices:

The mouth palpi of the spiders are modified into six segments terminating in a sort of nippers.

There are also the quelicerous, or small appendages on the front of the head near the mouth (which represent the intermediary antennæ of the crustaceous decapods), also terminating in a nippers which present on the lower outer edge of the immovable limb one very small tooth.

The legs, 8 in number, increase in size from the first to the last pair, their extremities are red.

On the under part of the body they have a triangular shield with a wrinkle or line in the middle part and two lateral borders in the lower part; this shield is called the sternum.

In the lower part of the abdomen are two comb-shaped organs having a varying number of so-called teeth, ranging from 15 to 32 in different specimens that I have examined. The use of these is unknown.¹

The epoch in which the sexes come together is during the hot humid days of early summer. That is during the first part of our rainy season.

The sexes differ only in that the male is a little smaller and narrower than the female, the nippers are wider and the combs have a larger number of teeth.

According to Ochoterena, Dufour and Maupertius, the scorpion produces 60 eggs, whose gestation lasts a year. The eggs appear on dissecting the female as small round white bodies about the size of a pin-head, each attached by a filament to the surrounding tissue.

Frequently all the eggs are not impregnated, and the next summer, a year later, it is common to find from 30 to 40 little scorpions which have been born or hatched in the body of the mother, and expelled alive and well formed. They cling in a mass on her back where she carries them for about a month.

During this period the female becomes thinner and thinner, and finally dies, and is at times devoured by her own offspring (Study of the scorpion of Durango, Prof. I. Ochoterena).

I have seen the mother's back partially gnawed or eaten away by her ungracious progeny while she was still alive.

The variety described inhabits the upper portion of the quebradas, or mountain valleys, that drain toward the Pacific coast, and as Durango is near the continental divide, in many places only three or four miles from

¹Like the spiders they have a simple form of lungs, sometimes called lung books, as during respiration they open and shut like the leaves of a book.

the town, this variety is not found, so that the district where it is encountered around Durango, is comparatively small.²

The records of the Municipality of Durango and its immediate vicinity give the number of deaths due to scorpion stings as 51 in the year 1907 and 53 in 1908, about equally divided between the sexes.

In the first quarter of 1909 there were 15 deaths, of which 10 occurred in the month of March. Of these 8 were females and 7 males.

Dr. José Fernando Ramirez gives the former average, when the population was much less than in 1907, at about 40 deaths per annum due to this cause (Dr. Carlos Santa Maria).



SOME VARIETIES OF SCORPION FOUND IN THIS DISTRICT OF DURANGO.

Nos. 1 and 2. The most poisonous variety. Tail and limbs light yellow. No. 3. Reddish-black. Very slightly poisonous. No. 4. Light red. No. 5. Red, short segmented; slightly poisonous.

²This same variety has been reported in Nombre de Dios, San Francisco de Mesquital, and San Andres de Tuel, in the State of Durango, and in various places in the State of Tepic, where similar death rates are reported. A young R. R. locomotive engineer, 26 years of age, was stung, in the State of Tepic, and died in two hours.

The variety is also reported near Altar, Sonora, and in the lower Gila region in Arizona, as well as in many small places near the boundary of the State of Sinaloa and the State of Durango.

The probability is that its habitat is more extensive than is generally supposed. All these places are on the Pacific slope, and there are several other less poisonous varieties commonly found in the same localities.

The area covered by these statistics does not now contain over 50,000 inhabitants, so we have an annual death-rate due to the stings of this scorpion of about one per thousand.

Now in the statistics published by Dr. Chas. Todd for Egyptian towns for seven years, the largest death-rate shown in his tables is Assouan, 0.640 per thousand per annum (*The Journal of Hygiene*, April, 1909, C. Todd).

As Dr. Todd says of Egypt, here also the deaths occur almost entirely among children under 12 years of age, though adults occasionally succumb. I have personally observed in the past two years, the death of a woman 20 years of age, and another of a girl aged 15 years, both due to this cause. The woman died within 40 minutes of being stung; also another case of a boy 8 years of age who died 30 minutes after being stung.

Dr. Santa Maria cites a case of a girl 15 years of age, who died 60 minutes after being stung (*Memoria sobre el metodo curativa del piquete de Alacrán*, Dr. Carlos Santa Maria, 1867).

The city of Durango has for many years paid a bounty for the destruction of this pest, and the number destroyed by the authorities, according to Dr. Herrera, has averaged for a long period, 70,000 per annum (Cavaroz, *Mil: Med: Mem*).

Dr. Eduardo Hernandez informs me that while he was in charge of the destruction of the scorpions for the Municipality of Durango the number destroyed in one year reached 80,000.

Dr. Santa Maria in his interesting monograph believes that adding to these figures those killed in the houses and not brought to the authorities would raise the number destroyed to 200,000 annually.

The epoch in which the mortality is greatest is the spring of the year, when the "Alacrán" (scorpion) comes out from its period of hibernation with its poison glands extra loaded.

Later in the year the same alacrán is not nearly so dangerous; if one shakes him about a little and irritates him he will discharge much of the poison in efforts to sting, and then the sting produces little effect.

I believe that to this cause is due the failure of some students in distant parts of the world to find this scorpion nearly as poisonous as our local experience proves. Yet the sting of a specimen I sent Dr. Menger of San Antonio, Texas, promptly killed a mouse.

As regards its physical and chemical properties, the poison extracted from the glands by squeezing is a transparent liquid similar to albumin-water. When agitated it produces a froth. It is of a decidedly acid reaction. When obtained by grinding up the glands in water or normal saline solution and evaporating in a vacuum it produces small scaly flakes of a dark yellow color, which again readily dissolve in water, normal saline, glycerine, or dilute alcohol.

Pure alcohol, iodine, ether, ammonia and tannin precipitate the venom, but these precipitates redissolve in water or normal saline. The venom is also precipitated by lead acetate and nitrate of silver.

This property has been utilized to secure an exceptionally pure solution of venom (Fernando Gomez Palacio, 1905, and C. Todd, *Journal of Hygiene*, April, 1909).

I am told that in the City of Mexico they use absolute alcohol for this purpose in their experiments.

The venom is unaffected by drying. Like bacterial toxins it is precipitated by saturating its solution with ammonium sulphate (Wilson and Todd).

It is very stable and resists putrefaction.

It has been heated to 97° for half an hour without losing its toxicity, but if heated to 98° for 10 minutes its toxic power is entirely destroyed (Fernando Gomez Palacio).

Keeping it under a heat of 38° during a period of 15 days did not alter its toxic power.

According to Vergara Lope and Gomez Palacio solar light rapidly destroys the venom.

"The foregoing exposition shows that these poisons are much more resistant to the action of heat than the microbic toxins and the diastases in general, bodies which they resemble much in their physical and chemical properties."

Chemically this poison is a toxalbumin, that is, a substance that presents the composition and reaction of the albuminoids, but to which has been added the factor of toxicity (Gomez Palacio).

M. Calmette announced the idea that the toxic principles of all different origins (including snakes and scorpions) were the same, and suggested the use of his anti-cobra serum as a remedy in cases of scorpion poisoning.

Vergara Lope, Gomez Palacio, C. Todd and myself, have failed to find any curative effect whatever in the use of antivenene.

Wilson, according to Todd, summarizes the symptoms of the toxin on susceptible animals as:

- A. Local irritation.
- B. Muscular twitching.
- C. Jumping movements.
- D. Lacrymation.
- E. Milky orbital secretion and salivation.
- F. Prolonged muscular spasms, most marked in the hind limbs, and affecting the muscular system generally.
- G. Erection of hair, especially on the fore part of the body and face, to which it gives a swollen appearance over the jaws.
- H. Passage of liquid feces (often absent).
- I. Erection of the penis and discharge of semen.
- J. Apparent paralysis, the animal lying on the side, the abdominal muscles usually tense, breathing shallow, and expiration prolonged.
- K. Symptoms of asphyxia, blueness of the mucous membranes, convulsions and intermittent gasping respiration.
- L. Cessation of respiratory movements, gradual slowing and stoppage

of the heart-beat. This last was notable in the case of the girl of 15 whose death I observed.

"Talaat concludes that the toxin acts on the nerve centers, especially the medulla and spinal cord, and cites the following experiment:

"A guinea-pig of 750 grammes was stung by a scorpion and died after 70 minutes showing all the symptoms of acute poisoning; the medulla and spinal cord were removed and allowed to macerate for 7 days in 25 cubic centimeters of glycerine; after this one cubic centimeter of the glycerine extract was injected intraperitoneally into a guinea-pig whose weight is not stated, and this was found to cause death with typical symptoms in 60 minutes" (quoted from C. Todd).

This is peculiar, as it would seem that in a fatal case, there was an increase of venom in the organism.

"Another experiment: Take a frog and dissect the sciatic nerve of one of the posterior limbs and divide it into sections, and afterward isolate the muscle of the leg on the same side, respecting the vascular relation. Now you have a muscle from which the central nervous connection has been eliminated. A scorpion is caused to sting into the mass of the muscle. Energetic and frequent contractions are immediately observed; 10 minutes after the sting these movements begin to diminish. In the rest of the animal no symptom whatever is yet observed. The divided nerve is perfectly sensible to the voltaic current. Approximately 1 hour and 10 minutes after the sting in the uncovered muscle there appear convulsions in the other muscular groups. In the meantime the excitability to the current has disappeared in the isolated muscle, and thus the venom, after its convulsive action on the muscular fiber, later produces a local motor paralytic action."

In a series of experiments Todd paralyzes the terminal motor plates by curare, so as to convince himself that the first action of the venom is on the muscle fibers and not upon the nerve centers, but he admits that the later general convulsions may be due to an action on the nerve centers (Vergara Lope and Fernandez Gomez Palacio).³

The action of the venom of Egyptian scorpions on the blood, according to Todd, is as follows:

Unlike snake venom it appears to have no effect on the coagulability of the blood, nor does it appear to have any hemolytic action on the blood-corpuscles (verified).

It also has a very irritating effect upon the mucous membranes, and this is noted by Vergara Lope and Gomez Palacio. Todd speaks of the very irritating effect of the dust of dried glands on the mucous membranes of the nose.

Gomez Palacio speaks of rabbits sneezing, and I have noticed that children when stung complain of a burning and itching of the nose, and

³I have verified the above statements in regard to the venom of the *Centrurus exilicauda*, Wood.

sometimes insist that they feel a foreign body in the nose. Many report nausea and sneezing.

Dr. Vergara Lope proceeds in the following manner to obtain the liquid poison which he employs in his experiments:

He takes a sufficient number of Joutla scorpions and washes them in a solution of formalin, 1 to 2,000, so as to remove all earth and other impurities, and after this they are placed in the sun until thoroughly dry. He then proceeds to cut off the terminal portion of the tail, containing the poison glands; these are then placed in a mortar and pulverized with a mixture of neutral glycerine and sterilized water in the following proportions:

Poison glands	5 grammes
Neutral glycerine	10 grammes
Distilled boiled water.....	40 grammes

Thus we have a poisonous fluid about equal to one in ten. This liquid is filtered and the filtrate has a light yellow color, is inodorous, and has a markedly sweet taste. He preserves the bodies of the scorpions, and from these Dr. Vergara Lope undertook to experiment and see if a liquid prepared from the bodies of the scorpions, deprived of their poison glands, would have a preventive or curative effect on animals into the bodies of which the poison had been first injected.

The success of this method would seem to depend on the scorpion being immune to its own venom, and most authorities agree that this is the case.

There certainly seems to be a partial immunity, but in several cases where I have forced one scorpion to sting another there were no symptoms, except that the scorpion stung showed torpidity and invariably the next day I found him dead.

I have seen them fight or struggle with each other face to face, each apparently parrying and grasping his adversary with his nippers, and using every effort to prevent being stung, and I suspect that the immunity is not complete.

To prepare this anti-liquid we take the bodies of 80 scorpions from which the poison glands have been amputated, and pound them in a crystal mortar, adding boiled and distilled water as in the following formula:

Scorpions without poison.....	80.00
Water distilled and sterilized.....	160.00

We thus have a liquid in which is a certain quantity of scorpions, to which is added double the quantity of water.

The liquid so obtained is passed through an aseptic cloth, and is afterwards put into a centrifuge during a sufficient time. When it has been well centrifugated, the liquor is divided into various layers whose description is as follows:

- 1st. In the upper part a white layer with a greasy aspect.
- 2nd. A turbid layer, opalescent yellow, with a light violaceous coloring

FERNANDO GOMEZ PALACIO. TABLE No. 4.

LIQUOR PREPARED WITH THE BODIES OF SCORPIONS AS A PREVENTIVE.

ANIMALS	WEIGHT	PREVENTIVE DOSE	INTERVAL	TOXIC DOSE	BEGINNING	SYMPTOMS	DEATH	RESULTS
1st Pigeon	302 grammes	8½ c.c.	1 hr. 15 min.	A sting	At 5 minutes	Convulsions and contractions	1 hr. 20 m.	The anti-poisonous liquor was not a preventive
2nd "	265 "	5 c.c.	12 minutes	1½ c.c. S.C.	At 2 hrs. 45 m.	"	26 hrs. 20 m.	Death was retarded by the preventive injection
3rd "	265 "	4 c.c.	8 "	A sting	"	Hypnotic effects	No	Preventive
4th "	295 "	4 c.c.	5 "	1 c.c.	"	"	No	Preventive
5th "	297 "	5 c.c.	10 "	A sting	"	None	No	Preventive
6th "	330 "	3 c.c.	10 "	A sting	50 minutes	Tremblings, paralysis	No	Preventive
1st Rabbit	1677 "	6 c.i.v.	10 "	2 Scorpions	1 hr. 5 min.	Inquietude and swallowings	No	Preventive
2nd "	2K.55 "	6 c.c.	10 "	2 stings	"	Some slight paralysis	No	Preventive
3rd "	1235 "	5 c.c.	10 "	1 sting	4 hours	Paralysis	12 hrs. D.	Death was retarded
9							In 3	

It is seen that of 9 animals, 3 died; 1 in almost normal time and 2 with a notable retardation.

The 6 animals that did not die, showed almost no symptoms of poisoning. These experiments make us hope that the liquor prepared from the bodies of scorpions without poison, will be a preventive.

in the lower half and somewhat greenish in the upper. This is the portion employed as an anti-poison.

3rd. A pulverulent layer, clear violet, mottled with darker violet.

4th. Very dark violet, almost black, pulverulent.

5th. Pulverulent, with the color of the second layer.

6th. Pulverulent, a little grayer than the 5th.

This liquid used in experiments is afterwards filtered, and, to preserve it, is submitted to tindalization and put in small vessels covered with cotton.

Prepared in this manner it has a transparent liquid appearance of a bright yellow color.

Injected in doses of 10 to 11 c. c. into the marginal vein of a rabbit's ear it has a markedly hypnotic action, which disappears in about twelve hours.

This liquor was tested as to its curative power.

The results of the experiments are shown on Palacio's Table No. 4.

In this table it is seen that of 9 animals injected to neutralize the toxic effects, 3 died; 1 in almost the normal limit and 2 with a notable retardation.

The 6 animals that did not die, showed almost no symptoms of poisoning.

"These experiments," says Dr. Lope, "lead us to hope that the liquor prepared from the bodies of the scorpions will be a preventive" (Gomez Palacio).

"In problems like the present, of a complexity so great, and with experiments that are only now at the beginning, the conclusions arrived at must be doubtful, and I hope that new ones may be made to confirm or disprove them."

As soon as the season arrives when I can secure the scorpions in sufficient quantity, I shall endeavor to continue his experiments.

C. Todd prepares his venom by nipping off the sting and the last joint of the tail and drying them a day or so in the sun. He then places them in desiccators over calcium chloride where they are kept until required for use.

"When a solution of the venom is required, the dried stings and venom glands are ground to a fine powder in a Turkish coffee-mill and added to an 8 per cent. saline solution, in the proportion of one sting to 1 c.c. of saline solution. The resulting suspension is agitated by means of a mechanical stirrer for one or two hours and then centrifugated. The supernatant opalescent fluid is clarified by the addition of a little aluminum sulphate and lime water, in order to get rid of any spores that might not have been removed by centrifugating. The product is then placed in stoppered bottles with a little chloroform and kept in the ice safe until used.

"Prepared by the above method, the venom is found to be very stable

and the method is more practical than extraction by glycerine as formerly used; the chloroform is easily removed by allowing filtered air to bubble through the solution. Todd found that precipitation by alcohol or ammonium sulphate was either too complicated for practical use, or that it resulted in a great loss of venom."

*Preparation of anti-toxin.*⁴ By C. Todd.

For this purpose horses are used. The horse is very highly susceptible to scorpion venom, although the degree of susceptibility varies considerably in different individuals. One horse, which received subcutaneously the poison of only one scorpion showed very marked symptoms. The site of the injection was obviously very painful, and the animal stood with the tail arched, and the hind legs were often stretched out stiffly, presenting in fact the typical picture of an early case of tetanus.

For this reason in commencing the immunization, the venom was usually mixed with Gram's solution of iodine. This mixture causes no symptoms, but appears to create a certain degree of immunity, so that later when the venom is given alone it is better supported. When large doses were given, they always caused very severe symptoms, viz: pain at the site of inoculation, profuse salivation, repeated straining, with passage of urine and feces, and great restlessness and sweating.

The symptoms come on a few minutes after the injection, and last several hours.

Next morning the animal, as a rule, looks perfectly well, and shows nothing but some swelling at the site of the inoculation, or in the brisket.

The horses were weighed once a month, so as to have some check on their general condition; after bleeding, the blood was whipped, centrifugated, and filtered through a Berkefeld filter after the addition of 0.5 per cent. carbolic acid (Ehrlich's mixture). (C. Todd, *Journal of Hygiene*, April, 1909.)

Prophylactic action of the serum.

"The serum has a powerful prophylactic action. A guinea-pig weighing 690 grammes received 6 c.c. of somewhat weak anti-scorpion serum intraperitoneally, and a quarter of an hour later 0.5 c.c. of a scorpion extract (corresponding to 3 M. L. D.), the animal remained well and showed no symptoms." (C. Todd, *Journal of Hygiene*, April, 1909.)

Curative action of the serum.

The curative action of the serum naturally varies enormously with the method of administration of the venom and the serum.

If the venom is given intraperitoneally and followed after an interval of half an hour by an injection of serum also intraperitoneally, the results are most striking, as is shown in the accompanying table.

⁴Since reading the *Journal of Hygiene*, of April, 1909, I have used C. Todd's method of preparing the solution of venom for my experiments here.

(C. TODD, *Journal of Hygiene*, April, 1909.)

Curative action of scorpion anti-venom on guinea-pigs. Venom given intraperitoneally followed by the anti-serum, also intraperitoneally half an hour later.

ANIMALS RECEIVING SERUM.				CONTROLS (NO SERUM).			
WEIGHT OF GUINEA-PIG	VENOM IN C.C.	ANTI-SERUM IN C.C.	RESULT	WEIGHT OF GUINEA-PIG	VENOM IN C.C.	ANTI-SERUM	RESULT
460 gram	0.20	2.0	Recovered	460 gram	0.20	Died in 4 hours
510 "	0.25	2.0	Recovered	540 "	0.25	Died in 3 hrs. 20 m.
500 "	0.30	2.0	Recovered	480 "	0.30	Died in 1 hour

If the venom is given subcutaneously, followed by the serum also given subcutaneously after an interval of half an hour, the results are not so striking.

The animal can be saved from the effects of one certain minimal lethal dose, but if larger quantities of the venom are given, there is only a retardation of the time of death (C. Todd, *Journal of Hygiene*, April, 1909).

Use of the serum in man.

"During the past summer a certain quantity of anti-scorpion serum has been issued to the government medical officers in Cairo and to the hospitals of Upper Egypt for the treatment of cases of scorpion sting, and a number of reports on the subject have been received.

"The number of cases, however, concerning which full details are available is not yet sufficient to allow of any conclusions as to the effect on the mortality, particularly as it is very difficult to obtain any reliable statistics as to the percentage of deaths in untreated cases. Out of 23 cases in the town of Cairo, which were treated with serum, only one death occurred. This was in a child two years old, who was not treated until two hours after having been stung.⁵ The child then received 5 c.c. of serum, but unfortunately the only serum available at the moment was a somewhat weak one over a year old. The general impression gained by those who have used the serum is very favorable, and almost all the reports note a very striking effect on the severe pain of the sting (C. Todd, *Journal of Hygiene*, April, 1909).

Conclusions of C. Todd, *Journal of Hygiene*, April, 1909.

1st. The immunization of suitable animals with scorpion poison gives rise to the production of an anti-venom.

2nd. This anti-venom is capable of neutralizing the venom when mixed with it *in vitro*, and also acts both prophylactically and curatively in animals.

⁵Here after two hours one finds the toxic symptoms at their maximum severity, and in a child so young and not treated for two hours, it is not surprising that death occurred.

3rd. The venom is not fixed by the central nervous system, as is the case with tetanus toxin.

4th. Calmette's antivenene could not be shown to have any neutralizing effect on the venom used.

5th. Employed curatively in man, the serum appears to have a very marked effect on the intense pain following the sting.

SYMPTOMS.

The symptoms produced in the human being by the sting of the Durango scorpion are:

1st. A stinging burning sensation, like a hot needle being plunged into the flesh. It is a peculiar sensation and is always recognized, even by those who are stung for the first time and who did not see the "alacrán" (Spanish name for scorpion).

A few moments afterwards the place becomes red, and a small vesicle rises up. This is followed by a very severe pain in the part affected.

2nd. Then, in a period that varies from three or four minutes to half an hour, the part becomes numb.

The throat, floor of mouth and nose, feel as if they had been struck a blow with some penetrating instrument, and contained a foreign body which pressed on the part; the tongue frequently becomes thick, and it is difficult, and at many times impossible to swallow or to pronounce words clearly.

A notable increase in the secretions of the eyes, nose, and mouth, and a constant effort to cough up or vomit a sticky, stringy elastic mucus is always present.

A constant and very marked desire to rub the nose and face is always present.

Then spasms or convulsions of the entire body soon begin but are more marked in the legs and back.

They are accompanied by a straining and grunting, and more or less paralysis of the respiration, and croupy-like sounds, as though the throat was closing.

These convulsions come in waves and increase in severity for about one and one-half to two hours, or in severe cases until a fatal result. When the case ends in death, the respiration stops a full minute before the pulse ceases to beat. In cases having a favorable outcome, the convulsions come at less frequent intervals and are not so severe after two hours. I saw a man thirty-six years of age and of good physique and habits, suffer from severe convulsions during a period of ten hours after being stung, but this is rare.

While ordinarily we assume that if the patient survives for three hours he is out of danger, nevertheless I have known of cases of death occurring six and eight hours after the sting, but probably these deaths

were due to general exhaustion from long periods of convulsions (Dr. Eduardo Hernandez reports a death after 14 hours).

The face during the period of muscle contractions becomes livid, probably from interference with respiration, and the pulse becomes very rapid, the eyes are bloodshot, and many times the patient spits up more or less blood, which I think is due to the effort to clear the throat of the sticky loathsome mucus. Generally there is a rise of temperature to 40° or 40.5° C. in the severe cases.

In a child it is frequently impossible to find the location of the sting, but the convulsions, the anxiety and struggle for breath, the frantic pulling at the nose, and the efforts to expel the sticky mucus are so typical that when one has seen a single case, there is no danger of a mistaken diagnosis thereafter.

Dr. Eduardo Hernandez says that, in cases of doubt as to the location of the sting it is much more easily found on wetting the hand and passing it over the part.

The pain in the part stung is sometimes very severe and is followed by a numbness that lasts for weeks.

Personally I have suffered this, when the entire side of my body on which I was stung was numb and without muscular sensation for a week. In this case I was stung in the palm of the hand.

One of our local scientists experienced the prickling sensations and numbness after a slight scratch on the wrist from the stinger of a dead scorpion.

The natives assure me that both light and currents of air increase the severity of the convulsions, and if the stomach is full there is much more danger of a fatal result.

TREATMENT.

The popular remedy is a spoonful of turpentine on a lump of sugar, and it certainly seems to modify the symptoms. I have found that the peons also ligate, when possible, above the part stung, and burn with a live coal or cigarette the place where the sting entered. Some give alcohol, or alcohol in which a number of bodies of scorpions have been kept for a long period. Ammonia locally, or ammonia with sweet oil applied externally, is used.

One rather novel remedy is to have the person stung eat his own excrement, or an infusion of excrement.

The local drug stores have prepared for these cases cucharadas (Spanish for "spoonfuls") of chloral hydrate and ammonium bromide and it is astonishing the quantity of chloral that a child can take during these convulsions without any noticeable effect.⁶

Aconite has been recommended, and at Dr. Hodgson's suggestion I tried tincture of cedron seed, which seems to modify the symptoms somewhat.

In adults a good-sized dose of chloral and bromides is ordinarily all that is needed.

⁶A local physician reports a case of a child of six years who took 6 grammes (90 grains) of Chloral hydrate during a period of three hours without any modification of the convulsions, and recovered, showing no toxic effects of the chloral.

The symptomatic antidote par excellence is chloroform. Since I began giving chloroform to children at once and continuing so as to modify the convulsions for three hours, I have not had a fatal result. In those cases which would inevitably end fatally without the chloroform, I have had notably favorable results, and until I secure a certain anti-toxin or anti-venom, I shall depend on this remedy.

Since iodine in very small quantities modifies the venom, I usually give a dose of the tincture well diluted in water at once.

Experience has shown that every effort must be made to get up a profuse perspiration, and in children I use hot water baths, and have had good results in adults with injections of pilocarpine.

In our experiments here, we have found the conclusions of C. Todd with the venom of the Egyptian scorpions and his cited reference to the work of Wilson, to be true in regard to the scorpion of Durango, and as the matter is so well gone over by him, I have largely quoted his work.

If possible, I hope to secure some of his antitoxin for experiment here, before our next meeting.

When I first began to look into this matter, I found nothing that classified and arranged the known facts and work on the subject, and it has been my aim in this article to prepare a serviceable rehash of what literature I was able to find in both English and Spanish, and to give some of my own experiences.

I am informed that there is a small non-poisonous lizard in British India, whose food consists principally of spiders and scorpions, and I am endeavoring to secure some and see if they cannot be acclimated in this vicinity.

Don Federico Damm, a local scientist who has been studying the lizards of the Sierra Madre, informs me that he captured alive some nine varieties which he kept in a glass cage and fed on spiders, insects, etc. The idea occurred to him to feed them on scorpions of the poisonous variety, first removing the stings, and they ate them readily with apparently no disagreeable results. Then he gave them the living scorpions without removing the stinger and eight of them died. The ninth, a small black variety of the family *Trapidurus*, ate scorpions with avidity and was kept upon this exclusive diet for a period of six months, with no bad results.

This variety is a native of the higher mountains and has not been found in this immediate vicinity.

I am making efforts to test also the local varieties of lizard in this way. I also wish to test an injection of a solution of iodine directly after the sting into the part stung. As so small a quantity of iodine renders the poison inert outside the body, I am in hopes that it may do so when used promptly in the organism.

As soon as the season arrives when I can secure material, I shall continue the experiments.

The common belief among many in this region is that the sting of any variety is a preventive of malaria.

Several parties of Americans who have made prolonged visits in the malarial regions assure me that members of the party who had been stung by scorpions, were the only ones who did not suffer from malaria.

THE ETIOLOGY OF EPIDERMIDOLYSIS BULLOSA.*

By M. F. ENGMAN, M. D., and W. H. MOOK, M. D., of St. Louis.

Epidermidolysis bullosa is a rare affection of the skin characterized by the formation of vesicles and blebs on any portion of the body following trauma, such as rubbing, striking, or by other means of irritating the skin. It is in many cases hereditary, frequently having existed for generations in families, though this tendency is by no means the rule. It usually begins within a few days after birth, and persists throughout life. The bullæ can be produced at all times on any portion of the body by more or less severe trauma. Rubbing the skin vigorously with a rough towel is followed within a short time by an erythematous wheal, the serum escaping from the injured capillaries dissects the slightly edematous epidermis from the cutis, and a vesicle, or bulba, results. The contents of the lesion depends on the degree of trauma, and may be serous, sero-sanguineous or hemorrhagic. If secondary infection, which is necessarily frequent, is present, many crusted impetiginous lesions will be observed. In 1905,¹ we reported the histological findings of two cases at the 29th annual meeting of the American Dermatological Association; in 1909, two more cases at the 33d meeting of the same Association (report soon to appear in *The Journal of Cutaneous Diseases*), and we have recently had another very typical case under our observation.

The patient, J. P., applied for treatment at the St. Louis Skin and Cancer Hospital February 11th, 1910, service of Dr. Engman. He is 12 years of age. His health had always been perfect except for his skin affection. He is the youngest of thirteen children, none of whom has ever suffered from any skin disease, and none of his ancestors on maternal or paternal side had ever been known to have a similar affection.

Examination revealed numerous large and small bullæ on his hands, forearms, neck and a few on the face. Some were serous, some sero-sanguineous, and a few on the hands were hemorrhagic. There was considerable secondary staphylococcic infection, the ruptured bullæ having left excoriated surfaces which were constant culture media for the development of organisms. His mother stated that a blister was noticed on his left heel a few days after birth, and that ever since that time the blisters followed any slight or severe injury on any portion of his body. He was induced to enter the hospital for study. Examination of his body revealed numerous large and small superficial cicatrices, generally at points of irritation, such as buttocks, waist-line, ankles, where shoes were laced, and on his neck. There were no milium-like cysts. The

*From the Laboratory of the St. Louis Skin and Cancer Hospital.

nails were rough, corrugated, some partially destroyed, though none entirely. He represented the dystrophic type of the disease; but the amount of infection suggested, in his case at least, that the dystrophic form may really not be a distinct entity, but an inherent tendency to scar formation in certain individuals, as a result of severe or only slight infections.

In an ever-present affection, like one of this character, we naturally expect the pathological condition can best be studied by examination of the apparently normal skin. A small piece of apparently normal skin was excised from the patient's thigh, fixed and hardened in alcohol, and stained with Unna's acid orcein, Weigert's elastic tissue stain, picrocarmin, thionin, hematoxylin, fuchsin, neutral orcein, and polychrome methylene-blue stains.

The epidermis in all sections was practically normal, except for slight oedema of the basal epithelial cells. The greatest change was in the almost complete absence of elastic tissue in the upper, and papillary, portions of the derma; an occasional fine fibril, or minute network of only the finest fibrils being seen in the portion connecting the epidermis. The capillaries, not having the normal supporting network of elastic tissue, showed slight dilatation in the upper portions of the cutis. The elastic tissue in the deeper portion was present to a considerable degree, though the fibres were shorter, thicker, and not so wavy as is usually found in normal skin.

There was no cellular infiltration about the vessels indicating any kind of inflammation.

The lymph channels and spaces all showed marked dilatation, a natural consequence of the absence of the supporting elastic tissue. There was no elacin degeneration.

The functions of the elastic tissue are to give tenacity and tone to the skin, to exert a controlling influence on, and support to, the dilating and contracting lymphatic channels, as well as to the arterial and venous vessels; and, what is more important, to cement the epidermis to the true skin. In examining sections of normal skin of normal individuals, we find a rich network of elastic fibres, beautifully distributed throughout the entire papillary, and upper portions of the corium. Examination with the high power, and oil immersion, reveals a rich distribution of the finest fibrils, extending upwards, like the branches of a tree, into the epidermis in all directions, sometimes as far as the seventh or eighth row of epithelial cells.

If one understands thoroughly this firm grasping of the ramifications of the elastic fibres by the prickles of the epithelial cells, one can readily see how easily a bulla could be produced in an individual in whom the elastic tissue is absent or deficient in these areas, by the escape of serum, lymph, or blood, from their channels, rushing toward the point of least resistance, viz., the epidermis, when the vaso-motor system reacts to stimulation.

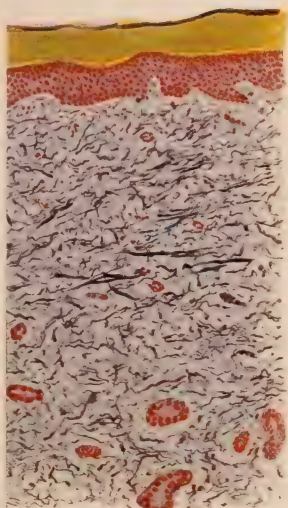


FIG. I.

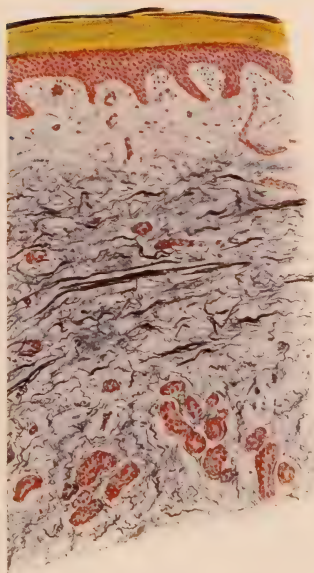


FIG II

FIG. I. NORMAL SKIN SHOWING NORMAL DISTRIBUTION OF ELASTIC TISSUE.

FIG. II. NORMAL SKIN OF EPIDERMIDOLYSIS BULLOSA PATIENT SHOWING
ABSENCE OF ELASTIC TISSUE IN THE UPPER AND PAPILLARY
PORTIONS OF THE DERMA

WEIGERT'S ELASTIC AND PICO-CARMINE STAINS

Having found the elastic tissue absent in five patients suffering from epidermidolysis bullosa, sections from all presenting practically the same histological picture, we feel justified in asserting this absence to be the etiological factor of the disease.

Kanoky and Sutton reported a case in the *Journal of the American Medical Association*, April 2, 1910, verifying the findings reported in our former articles.

HYPERESTHETIC RHINITIS (HAY FEVER).

By OTTO J. STEIN, M. D., of Chicago.Professor of Ear, Nose, and Throat Diseases in the Post-Graduate
Medical School.

It was in the year 1819 that Bostock, of England, gave to the medical world a description of the symptoms of hay fever which is so complete that it has remained practically unaltered these many years. But while the symptomatology of so-called hay fever has remained constant, its nomenclature, etiology, pathology, and treatment have all been subjected to the vicissitude of numerous changes, so that almost one hundred years after its description by Bostock hay fever to-day is a disorder about which many diverse opinions exist.

From a perusal of ancient medical history one is impressed by the similarity of symptoms of some of the "humors" and "head flux" of that period, with our present day hay fever, so that one can readily believe that it existed even at an early period, but was not fully classified. From a critical survey of the historical side of this subject it is evident that even one hundred years ago it occurred with much less frequency than it does to-day. The disorder is becoming year after year so prevalent, that those suffering yearly from its effects number into the hundreds of thousands, and particularly so in North America.

Personally, I consider the term "hyperesthetic rhinitis" the most correct expression for this class of disorders. The term "hay fever," to my mind, designates only a variety.

The etiology of this class of disorders has furnished a subject for manifold and widely separated opinions. Most of the opinions are but mere theories, having attached to them no tangible logic whatsoever, and admitting of no demonstrating proof. Some authors entertain the idea that it is a disorder of the nasal chambers alone; others, that its origin resides in some different organ, even though it manifests itself solely or chiefly in the nose; while others look on it as of universal origin, a general neurosis, an idiosyncrasy, and similar vacuous terms that lead one far afield, but to no where in particular. Aside from these latter hypothetical views there seems to be a unanimity of opinion, in that we have a condition to deal with that results from irritation of the nerve elements of the nose. Bostock attributed the irritation to the heat and light rays of the sun, while others declare that various odors, like that of a rose, for instance, or the emanations of certain animals explain the origin of the trouble. Elliotson was the first, I believe, to take an emphatic position on the pollen causation. Blackley carried out the earliest systematic investigations along this line, and his careful and painstaking experiments

brought him to the conclusion, agreed to by many to-day, that the pollen from certain cereals, grasses, and flowers is the irritating factor, although the manner in which this occurs was attributed to a mechanical as well as to a toxic effect. Among other factors that contribute to the manifestation of the disorder, some of the various forms of nasal obstruction, such as hyperplasia, edema, deflections, spurs, and also the presence of the vibrios in the nasal vestibule, are mentioned by various writers. Some observers look on the disorder as systemic in origin, due to excessive development or retention of uric acid producing the irritation within the nose. Heredity is a popularly attributed predisposing factor, as are also occupation, social status, age, sex, race, geographical locality, and climate. Bacteria have been accused of having something to do with its existence, but specific names have never entered into the indictment, and hence to-day no one ever takes the charge seriously. Nasal sinus disease, particularly disease of the maxillary sinus, has been a concomitant disorder in a few cases, and therefore supporters were won to a new cause. Most of us will concede, I believe, that in the manifestation of this disorder we have a physiological phenomenon carried to excess, so to say. The itching and tickling within the nose, followed by a succession of sneezes, and accompanied by watery discharge are, under ordinary conditions, but normal reflex manifestations, and only when prolonged and intensified do they become a perversion, and hence pathologic. The causes that contribute to physiological sneezing and lacrimation act upon certain terminal filaments of the trigeminal nerve, sending sensory impulses to the ganglionic centre, whence motor impulses are sent out by way of the sympathetic nerve system, which controls the vaso-motors, and in this way we have the engorgement of the nasal tissues that produces the tickling and itching, the sneezing, the stuffiness, and in addition the stimulation of gland activity, with consequent profuse discharge. It may be noted that the cause of physiological sneezing is not necessarily always the same. It may be due to the pepper or pungent condiment or essence used, the dust of a room, the acrid fumes of a laboratory, a draught of cold air, etc. The same holds good in hyperesthetic rhinitis. The external irritating causes are multitudinous. In one case it may be due to the pollen of rye, in another case to the pollen of some flower, like that of the golden rod or rag weed, and in another case the irritation may be due to the draft of an electric fan on the face of the individual, while in still another case different causes may provoke the successive attacks in the same individual. In hay fever the irritant need not of necessity exert itself upon the trigeminal nerve in order to bring about symptoms, for other nerve tissue may be just as susceptible to the influence of the irritant, although the results are manifested in the nose, throat and eyes. The periodicity of the disorder, recurring, as it frequently does, on a stated day each year, and lasting a definite number of weeks, has contributed liberally to the opinion that the particular pollen appearing and disappearing within these stated periods is by circumstance the exciting

agent, and furthermore this has been established by laboratory experiments. Altogether, the pollen of some one hundred and thirty different kinds of grasses and plants has been experimented with, although not all of them have proved capable of the production of irritating symptoms. Dunbar, by careful experiments, eliminates from consideration the mechanical causation, and attributes to the action of the pollen a purely chemical-physiologic character. He says that although the surfaces of many kinds of pollen exhibit hooks, needles, and pricks, while others are smooth and regular, it is neither this physical condition nor the ethereal oils contained within, that play a rôle in the causation, but a certain toxalbumin in the pollen, which is absorbed into the system and constitutes the irritating agent.

The disorder is commonest among those of sedentary occupation, where the mode of living and diet more often lead to faulty metabolism and improper elimination. This, to my reasoning, establishes within the patient the susceptibility so essential to the action of the exciting factor. The presence of a neurotic temperament is not, in my belief, an agent in its production, but it is only an association, a condition created by the same metabolic perversion. As I have attempted to show in previous papers on this subject (*Trans. Amer. Acad. of Ophthalmology and Oto-Laryngology*, 1907, and *Trans. Amer. Med. Assoc.*, 1908), two, and only two, elements are necessary to the creation of this disorder. And these two elements may, for the purpose of illustration, be compared to the positive and negative poles of an electric battery. The one pole, represented by the altered metabolism, constitutes the idiosyncrasy or susceptibility of the patient, the other pole is the exciting factor. By connecting these two elements there immediately results a discharge of nerve energy, manifested mainly in the territory supplied by the trigeminal nerve. That is to say, we have such paresthetic sensations as itching, burning, prickling and tickling of the mucous membranes of the eyes, nose, mouth, throat, and of the skin about the face. This is followed by irritation of the vascular and glandular structures of the nose and eyes, causing a turgescence of the tissues, and hypersecretion. These two elements may exist alone, but never call forth the syndrome of symptoms characteristic of hyperesthetic rhinitis.

I purposely refrain at this time from going into the symptomatology, pathology, and an analytical presentation of the treatment, because it would take up too much space; and, besides, my views on the entire subject may be found in other papers. (*Chicago Medical Recorder*, July, 1908; *Laryngoscope*, September, 1908.) There is but one phase of the treatment that I desire to emphasize at this time, and that is the use of alcohol injections of the nasal nerves. This method of treating hyperesthetic rhinitis and nasal hydropnea was first used by myself in 1906, and my first written report of its use was presented in a paper before the American Academy of Ophthalmology and Oto-Laryngology in 1907. Since that time, in fifty cases, including hyperesthetic rhinitis of various

types and nasal hydrorrhea, such injections have been made, and in only ten per cent. have we had negative results. Some of the cases were of the common autumnal variety, while others were of the spring type; and again there were some that occurred at indifferent periods of the year, or even continually throughout the year. A few of the cases were associated with distinct pathologic processes within the nose, such as polypi, spurs, ridges and deflections, but in the larger number the nostrils appeared free of contributing or irritating factors. About 10 per cent. of the hyperesthetic rhinitis cases were associated with asthmatic symptoms of considerable degree. A few very interesting cases of nasal hydrorrhea were among the number, all of from one to sixteen months' duration. The cases treated included children as well as adults. In the application of the injection treatment I reason that the trigeminal nerves have participated in the general nerve changes resulting from the perverted metabolism, and, owing to their unusually wide distribution over exposed mucous membrane surfaces, they are particularly susceptible to the influence of external exciting factors, the second element in the causation. Continuing this line of reasoning, it appears rational, and is true, that by eliminating either one of the causative elements the disorder is aborted, although in a majority of cases this becomes a very difficult matter. But as an alternative we may inhibit the perception of the irritant by injecting those branches of the trigeminal nerve whose filaments are distributed to the exposed mucous surfaces. By desensitizing the nasal branch of the fifth nerve we at once "disconnect" service between the irritant and the irritated. In the majority of our cases it has been found sufficient to confine our injection to the nasal nerves. In some, additional injections in the sphenopalatine area were found necessary. The nasal branch of the fifth nerve can be reached by way of the nostril at the extreme antero-superior angle, where it enters the nose from the cranial side, through the most anterior cribriform opening. A special needle, two and one-half inches long, of twenty-two gauge and with a very stub point, is attached to any hypodermic syringe. A second needle, four inches long, of eighteen-gauge and with a 45-degree curve at its end, is used when the posterior injections are required. Alcohol is used for injection because it disorganizes the elements of the nerve without serious destructive changes; moreover, it is sterile, and hence free from the danger of causing infection. Various strengths have been used, but I find that a 50 per cent. to 75 per cent. solution answers all the purposes of the full strength as formerly used. About 10 to 15 drops to each injection is the preferable amount. The area to be injected is first anesthetized with a 10 per cent. solution of cocaine on a tampon. At the same time the patient is given a tablet containing morphine, one-twelfth grain, atropine, one six-hundredth grain, caffeine, one-sixth grain, and instructed to take a similar tablet every three hours for three or four doses. These are given for the purpose of minimizing the pain incidental to the introduction of the alcohol. In some cases the pain after the injection

is quite severe, and may last for several hours, while again other patients complain but little. Personally, I have observed that when a severe sharp pain occurs, coursing along the area of distribution of the nerve injected, it is indicative of a successful injection. The question may arise whether the nerve itself has been injected, or only the surrounding tissues. I find that the severity of the pain and its distribution along the course of the nerve are in proportion to the degree of accuracy attained in the injection. In seeking the point of injection of the nasal nerve the cocaine solution usually depletes the membrane sufficiently to allow easy introduction of the needle point to the roof of the meatus. But in the presence of a high deflection difficulties may be encountered. It has been my practice of late to seek with the point of my needle the opening in the bone, through which the nerve enters the nose, and, as stated, this will be found at the extreme antero-superior angle of the attic, a millimeter or so external to the septum. When one feels the point of the needle enter the canal, the injection commences, and 10 to 15 drops of the fluid are slowly introduced. If successfully performed, the inhibition of nerve action immediately takes place, and will continue for a varying period of time. On a return of nerve activity the injection may be repeated. If the hay fever cases are taken in hand before the attacks commence, much better results are obtained, and with less likelihood of an early return. In refractory cases it has been found necessary to inject the spheno-palatine area in addition to the anterior nasal nerves. In my entire experience with this form of treatment I have never met with fatal, serious, or alarming results, and therefore I feel that in this nerve-blocking method we have a safe, reliable, and easily applied form of treatment for all varieties of hyperesthetic rhinitis and also nasal hydrorrhea.

100 State Street.

THE DIAGNOSIS AND PATHOLOGICAL FINDINGS IN AN UNUSUAL CASE OF EPITHELIOMA OF THE LARYNX.*

By D. BRYSON DELAVAN, M. D., of New York.

This case is presented because so many points of difficulty were involved in the making of a positive diagnosis. Every opportunity was given for its prolonged study and every known means of diagnosis at all applicable was exhausted. The physical signs and appearances present were inconclusive. The histological conditions, as available before the removal of the tumor, were absolutely misleading.

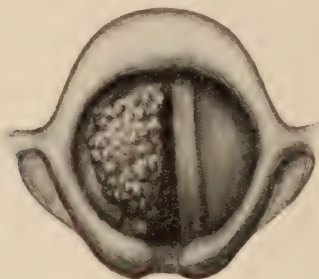
Last November, I was consulted by a gentleman from Havana, Cuba, referred by Dr. Carlos M. Desvernine of that city. Five months before my examination the patient had noticed hoarseness of the voice. This was slight at first but steadily increased, apparently without reason. In the course of time he consulted Dr. Desvernine, who found a small papillomatous-looking growth at the anterior aspect of the right side of the larynx, immediately above the vocal band. This gave no other sign of its presence except the loss of voice. Patient said that he was about 42 years old, but he seemed very much older. He was a widower, had seen much of the world, and gave the appearance of one who had lived well in a sub-tropical climate. His heart action was irritable and he was easily fatigued. Tuberculosis and syphilis were excluded by the usual tests. Aphonia was marked, but deglutition was apparently not greatly affected.

Examination of the upper air passages showed the nose and pharynx to be normal. The larynx in general was well formed and easy of examination. Its left half was normal. On the right side was what appeared to be a new growth. Its color was dark bluish red and its surface irregular. It extended from the anterior commissure backwards to a point nearly opposite the processus vocalis, and from the entrance of the ventricle of the larynx upwards, apparently for about half an inch. Considering the size of the area occupied by the neoplasm it projected but slightly into the lumen of the larynx. Dr. Desvernine stated, however, that its growth of late had been rapid and it was evident that a few weeks might determine the entire closure of the glottic space. It was difficult to demonstrate the sub-glottic region of the affected side, but, so far as could be seen, it was not encroached on, although the growth was evidently of considerable size and its extension backwards had brought it somewhat near to the posterior commissure. The movements of this side of the larynx in deep inspiration, however, were almost as perfect as

*Presented at a meeting of the N. Y. Clinical Society, Feb. 26th, 1910.

those of the unaffected side. The patient insisted that he had felt no pain in the larynx of any kind. The surface appearance of the growth was more suggestive of papilloma than of any other form of tumor. The peculiar flatness of the exposed surface of the growth would have made it almost impossible to secure a fragment for microscopic examination and made it highly probable that any fragment so removed would be superficial, and hence possibly untrustworthy.

The diagnosis thus became a matter of great difficulty. Dr. Desvernine, one of the most experienced of laryngologists, had been led to hope, on account of the distinct absence of the symptoms commonly met with in cancerous disease, that the growth was not malignant. I could not help agreeing with him as to the possibility of this. The symptom of pain, not invariably present in other cases, was conspicuously lacking in this. The complete mobility of the affected side of the larynx was



strong evidence against the presence of a malignant growth, as loss of motion due to infiltration of the muscles where the growth extends posteriorly is one of the most constant signs of malignancy, and one that is rarely absent. There was also absence of involvement of the lymphnodes in the neighborhood of the larynx.

Notwithstanding these negative conditions it seemed necessary, in view of the uncertainty of the diagnosis and the rapid development of the growth that prompt action should be taken. No attempt to eradicate it by intra-laryngeal means would have been likely to succeed. Even if it were not malignant its extraction would soon be required, by reason of its rapid encroachment upon the interior of the larynx.

I therefore advised a thyrotomy, for the purpose of finally determining the diagnosis and for the removal of the growth. The patient agreed to this and to whatever further interference might be necessary in order thoroughly to extirpate the disease, and he was placed in the hands of Dr. Joseph A. Blake. Proceeding to operation, the thyroid cartilage was divided, after a preliminary tracheotomy. Complete exposure of the

larynx showed that the findings of the laryngoscope had been correct. There was little apparent extension of the disease below the vocal bands. Dividing the mucous membrane and exploring the tumor it was found to extend far upwards, forwards, and outwards, beyond the base of the epiglottis. It appeared to be absolutely circumscribed and was surrounded by loose areas of connective tissue from which it was separated with the ease characteristic of a fibrous growth. The mass of the growth was considerable, its dimensions being $1\frac{1}{2}$ by $\frac{3}{4}$ of an inch. About half of the tumor, that part adjacent to its laryngeal surface, having been dissected out, was detached and sent at once to the pathologist, who quickly returned the following report:

"Specimen consists of two pieces of fairly reddish tissue. Cut surface of tumor translucent pink and homogenous. Microscopic examination: section through smaller bit, examined during operation, shows a fibrous stroma infiltrated with lymphoid cells and contains numerous serous glands. Surface covered with hypertrophied epithelium of the squamous type." When the remainder of the tumor was later removed and examined, sections through that part of it remote from the surface showed "irregular processes of squamous epithelial cells everywhere invading the underlying parts. Epithelial pearls numerous. Diagnosis: epithelioma."

It should be stated that the fragment of the growth sent to the laboratory for the first examination was that which lay next to the surface. It was only when the deepest structures were reached that the characteristic signs of epithelioma became visible. These were far distant from the surface and could not possibly have been reached by the usual intra laryngeal methods.

The case just reported illustrates more graphically than is common the diagnostic difficulties which may be present in laryngeal cancer, and some of the reasons for them. The situation is by no means a new one. Time and again, in other cases, microscopical diagnosis, attempted from examination of fragments of tissue removed superficially from a laryngeal growth, has been impossible.

From the histological nature of the growth described the prognosis as to non-recurrence would be particularly good. In another case recently operated on for me the opposite was true, for the report of the pathologist showed epithelioma of rapidly growing type. Too little attention often is paid to this feature of laryngeal cancer, for the relative malignancy of the type of disease present in a given case will at least strongly suggest, if not absolutely determine, the probability of its future development, and, if operated on, its liability or otherwise to recurrence.

GONORRHEAL VULVO-VAGINITIS; ITS SPECIFIC TREATMENT AND PROPHYLAXIS.

By WILLIAM J. BUTLER, A. M., M. D., of Chicago.

Professor and Head of the Department of Medicine, Chicago College of Medicine and Surgery (Medical Department, Valparaiso University), Attending Physician Cook County and Willard Hospitals.

There are few children's hospitals that are not visited occasionally by some contagious infection. Epidemics have been more or less minimized in some hospitals by rigid methods employed for their prevention, where such are practicable; on the other hand, others are quarantined a few months of every year. The chief reason why such things occur right along is, that the matter of isolation of every patient is not carried on beyond the observation or receiving wards. This question has not been developed to any extent here in either the construction, equipment, or management of hospitals, and, as a consequence, epidemics are a constant menace to the average children's hospital. The seriousness of this situation can hardly be overestimated, in view of the great susceptibility of children to diseases common to their period of life. In solving such matters, the basis of which is individual isolation throughout their stay in the hospital, the hospital staff must be a unit, and absolutely under one directing head. A hospital that is neither constructed nor equipped with this point in view, an independent nursing staff, a more or less unappreciative interne staff, render impossible the solving of such a problem as avoidance of epidemics. Unfortunately the arrangements of most hospitals present just such a situation.

Among the serious epidemics that visit children's hospitals, the internal medicine and surgical departments and also the contagious wards, is gonorrhea. It is a constant menace in many hospitals and some are never without it. Its starting point is always in a case or cases brought into the hospital, and once rooted in a hospital it is a difficult problem to remove it.

We have in the past found gonorrhœa an exceedingly intractable disease to treat. According to custom, it has been treated by antiseptic douches and instillations; and it is not an uncommon thing to see the disease continue active throughout several months of such treatment.

It is generally recognized that a true immunity against gonorrhea is not acquired. It is easy to understand that repeated reinfections are possible, where such children are grouped together.

As the method of therapy above referred to had never appeared to me satisfactory, I determined on a radical departure from it. I therefore began, with my assistant, Dr. J. P. Long, investigations with the view of de-

termining the value of gonococcus vaccine in the treatment of gonorrheal vulvo-vaginitis in children, that is, of active immunization of the patients with a vaccine consisting of killed gonococci.

We carried on our inoculations under the guidance of the opsonic index, which we studied carefully in each case. We began with small doses of vaccine, and, as our index suggested, continued with small, or proceeded to larger, doses, at the same time noting carefully the clinical effect of inoculations on our patients. The action on the local infection was usually prompt. For the first twenty-four hours following an inoculation there was often observed some increase in the discharge, but this was usually followed by considerable abatement, coincident often with the rise in the index, though it was not always possible to trace a direct quantitative relation between these latter phenomena. We not infrequently observed, however, that after two or three injections the discharge disappeared entirely and gonococci were absent from the smears.

Our first report covered twelve cases, in four of which the clinical appearance of gonorrhea disappeared in from ten days to three weeks. In five others a similar result was attained after a longer course of treatment, and in two of the remaining three that seemed particularly stubborn, cessation of discharge followed a change of vaccine from a monovalent stock vaccine to a polyvalent one.

The monovalent vaccine proved particularly effective in our work. We made no effort at making autogenous vaccines, as we were convinced from our experiences that no better results could have been expected from them than what we got with the stock vaccine.

Being considerably encouraged with the results of this treatment, we continued it with the same careful study of the index. We subsequently reported on twenty-five cases that had been treated throughout by gonococcus vaccine, the inoculations being guided by the index. Twelve of this number represented acute cases, which showed recovery in 75 per cent. and improvement in the remainder. Thirteen of the cases were chronic infections, and showed recovery in 85 per cent.

Although it had become evident from our first studies of the blood in these cases, with regard to inoculations, that approximately the average interval within which to make injections could be estimated, we continued our work with the index, with the view of placing on a sound footing, first, the average time that should intervene between inoculations with the vaccine; and, second, the average dose to be used in treatment. We decided that a patient should be inoculated at least every fifth day during treatment. We did not observe any particular advantage in beginning or continuing with large doses; on the contrary, we found that cases got along well, as indicated by the index and clinical improvement, on doses between five and ten millions, and we believed that an average dose for beginning treatment was from 10 to 25 millions, and that this dose might be increased if desired, but that we obtained our best results with doses of from 5 to 50 millions. Such a thing as exact dosage

is out of the question unless the index is followed, and, on the other hand, good clinical results will follow almost any dosage.

Hamilton and Cooke reported very satisfactory results from their use of gonococcus vaccine in a number of acute and chronic cases.

Churchill and Soper also reported on a number of cases, most of which responded promptly to the use of vaccine. The vaccine treatment of gonorrheal infections has attracted some attention in France, as indicated by the publications of Mainini, Maute, and Jarvis.

A very interesting report by Brück comes from Neisser's clinic in Breslau. Brück is especially enthusiastic on the results of vaccine therapy in gonorrheal vulvo-vaginitis.

B. Wallace Hamilton has recently reported his results in the vaccine treatment of 84 cases of vulvo-vaginitis. He states that 90 per cent. of his cases were cured, and that the average time of treatment was 1.7 months.

He gives the average period of treatment for his 260 cases that were treated by local measures as 10.1 months, and says that 60 per cent. of them were cured.

These several confirmatory reports which have followed our first paper on the vaccine treatment of gonorrheal vulvo-vaginitis convince me that we are justified in looking on it as a specific treatment for this form of infection in female children.

It might be well at this point to explain the preparation of the vaccine, with which all readers may not be familiar. A fresh culture of gonococci may be prepared from an acute case of gonorrhea, or a stock culture may be used. The medium on which the gonococcus grows best is blood agar or blood serum. A number of subcultures are made from the gonococcus culture on slants of the medium mentioned. After a growth of from eight to twenty-four hours, the cultures are washed off with several c.c. of salt solution, using the same salt solution in washing all slants, by pouring it from one tube to another until the process is completed, and then pouring the emulsion of gonococci so obtained into a sterile test tube, sealing and heating it at 60° C., for one hour. This kills the gonococci. To make sure of its being sterile, a culture should be made from the emulsion, after heating it. The emulsion is then standardized according to Wright's method, which is done by mixing an equal quantity of emulsion and blood, spreading on a slide, and staining with carbothionine. Then, under a microscope, all the red cells and all the bacteria seen in a large number of fields are counted. The number of bacteria are to the number of red cells counted as the number of bacteria in a c.c. of the emulsion are to the known number of red cells in a c.c. of blood. This emulsion, so standardized, constitutes gonococcus vaccine, and is now ready for use. If the vaccine is too concentrated it may be diluted with salt solution to any point desired; a good working emulsion contains 50 to 100 millions to the c.c.

The action of the vaccine on the local infection is through the immuniz-

ing apparatus of the individual, the protective substances exerting locally their effect on the gonococci. We know that one of these immunizing substances is a specific opsonin, as we can, in most cases following inoculation, note an oscillation in the opsonic index of the patient. Other immunizing substances, however, are, in all probability, produced by the organism. Brück, and also Müller and Oppenheim, showed that the blood of patients suffering from gonorrheal complications contained a specific complement-binding antibody. Brück was able to obtain this amboceptor in the blood of animals inoculated with gonococci or extracts of gonococci.

During the past two years we have treated a number of cases by this method. No local treatment except cleanliness of the parts was employed.

We discontinued the use of the index, as our first work had taught us the interval of time for injections and likewise a suitable dosage. We found that our results were practically the same as in our first work, namely, that in from 75 to 85 per cent. of all cases recovery ensued in a period of time varying from ten days to two months. By that is meant that the discharge disappears, and the smears are negative. After several of the latter are negative the patients are dismissed from the hospital. We have found it impossible to keep track of them after leaving the hospital.

My previous experience with local treatment, as already intimated, had been highly unsatisfactory. This treatment is usually prolonged, continuing in many instances a year and longer. I called attention to this in our first paper, by reporting in detail a number of cases that had received local treatment. H. W. Hamilton gives the average time in his cases, as above noted, as 10.1 months. I believe this to represent a fair average for the latter.

The results obtained by this method of treatment are very unsatisfactory compared with those by the vaccine. In only a small proportion of the cases do the patients leave the hospital free of discharge and free of gonococci in smears from the genitalia.

A matter which I deem of importance in the treatment of these cases, irrespective of what treatment is employed, is that the same principle of individual isolation should be carried out while they are in the hospital or home, because we know, first, that there is practically no immunity established against gonorrhea so far as protection against reinfection is concerned; and, second, that children are exceedingly susceptible to gonorrheal vulvo-vaginitis when in contact with others so infected.

A word as to the prophylaxis of this infection in hospitals may be of interest. There have been many views expressed as to the route of contagion in these cases. One proposition is certain, the infection must be carried to the genitalia. It was long thought that the laundry had much to do with disseminating the infection in hospitals. This I have been able to disprove by the following experience: At the County Hospital

we have an observation ward for female children in which they are kept as long as possible up to 12 or 14 days. When this procedure was started, individual isolation was carried out as thoroughly as hospital appointments rendered practicable. Smears from these children were examined daily, and if a child was found infected it was transferred immediately to a department for such children. Many children are discharged from this observation ward without ever entering the main wards. During a period of three months close account was kept, and it was found that, although a number of cases in which among other diseases, a gonorrheal vulvo-vaginitis was present, had been received into the observation ward, not one case had developed in the observation ward. At the same time we had a mild epidemic in the main wards. The clothes from the children of the observation and main wards were laundered together. This seemed to me convincing proof against the laundry as a means of spreading the infection. In the observation ward no tub bathing took place, and the articles used in their toilet were kept separate. In taking smears, which was, but should not be, done by the nurses, they disinfected their hands between the handling of each case. And right here one of the chief means of distributing gonorrhea in children in hospitals comes in, viz., not only in the taking of smears, but in the changing of children, and in taking temperatures, not from the thermometers, but from hands infected from handling one case after another without intermediate care of the hands. Rubber gloves should be worn when engaged in such work, and the gloved hands disinfected between cases. Thermometers are not a source of infection *per se*, because if they were, we should have gonorrheal proctitis, which we never see. Bathing in a common bath tub, or bathing infants on the same slab by a nurse whose hands are contaminated from handling infants that may have hardly a perceptible discharge, children using the same toilet without disinfection of the seat at intervals of non-use, also the non-enforcement of tight cloth protection for all female children, are some of the more important, if not predominating, causes for the spread of such infections in children's hospitals.

In conclusion I wish to emphasize the importance of individual isolation, so far as it is practicable, during the entire residence of children in hospitals, in order to minimize the occurrence of epidemics. The responsibility resting with hospitals to insure this is self-evident.

The specific treatment of gonorrheal vulvo-vaginitis by gonococcus vaccine, as outlined above, has been proved incomparably more efficient than local treatment, which it is to be hoped will be abandoned, save in exceptional instances, in which it may be thought desirable to combine both methods.

DIFFERENTIAL POINTS IN THE CHARACTER OF THE
BONE LESION IN THE TUBERCULOUS AND ACUTE
OSTEOMYELITIS, RACHITIS AND SYPHILIS.*

By ALEXANDER EARLE HORWITZ, A. M., M. D., of St. Louis.

There are two varieties of bone lesions under which the greater number of affections can be placed. Broadly speaking these are constructive and destructive. Osteomyelitis and syphilis may be termed constructive; rickets and tuberculosis, destructive. Acute osteomyelitis is at first destructive with a strong secondary constructive tendency. Syphilis comes strictly within its constructive limitation. Rickets causes a proliferation at the epiphyseal ends, but even here, and within the shaft, its main tendency is destructive. Tuberculosis is strictly destructive. In this paper I shall limit myself entirely to the radiographic appearance of the bone lesion and radiographic interpretation. All the plates here shown were taken of cases I had under observation at the Boston Children's Hospital, and the conclusions drawn are based upon the examination of these and many other plates.

The four conditions enumerated in my heading are not always easily differentiated. Tuberculosis and pyogenic osteomyelitis offer many parallel symptoms. Close observation has taught us—and we now adopt that view—that tuberculosis attacks the epiphysis and only, secondarily, enters the diaphysis, and that osteomyelitis acts to the contrary, shaft first, epiphysis by extension.

In the second group, rickets and syphilis, we again note parallel symptoms. The secondary rachitic bowing of a limb is frequently mistaken for syphilitic thickening, especially in the tibia. In both diseases we get epiphyseal enlargements, but the character of each differs, corresponding to the underlying cause or causes. We will also note that syphilis may itself be divided into two classes, hereditary and acquired, each presenting a distinct bone picture. The bone changes depend, to a degree, upon which bone-producing factor is involved: the endosteum, periosteum, or epiphysis. The sluggish tubercle bacillus finds a good nidus within the extremely vascular portion of the bone—the epiphysis, the shaft offering too great a resistance to its activity. The more virulent pyogenic organisms are able to attack the denser diaphysis, and not meeting so hostile a field of phagocytes as would be encountered within the epiphysis, their work of destruction begins. The irritation caused by the tubercle bacillus within the epiphysis is not sufficiently great to excite an active phago-

*Read before the Surgical Section of the St. Louis Medical Society, March 26, 1910.

cytosis, and a slow destruction ensues. In tuberculosis we therefore find what we may term an eccentric destruction, proceeding from within outward; in pyogenic osteomyelitis a concentric destruction, from without inward.

The virus of syphilis appears to have a predilection for the periosteum, this showing a marked degree of irritation with a consequent proliferation. The endosteum is to some extent also irritated, with a consequent encroachment upon the medullary portion of the bone. This new periosteal bone is very dense and is characteristic of syphilis. It is this eburnation which differentiates it from the other conditions here under discussion.

In rickets there is also some thickening of the cortex in a bone secondarily bowed. This thickening is, however, always on the concavity



Fig. 1.



Fig. 2.

Fig. 1. Congenital Syphilis. Periostitis with deposit of dense bone in successive layers. Medulla not involved. Contrast this with Fig. 4.

Fig. 2. Rachitis. Widening of epiphysis; diaphysis cup-shaped.

of the bone and the medulla is not materially encroached upon. The thickening is produced by the endosteum, evidenced by the fact that the shaft has not become thickened or increased in diameter. In congenital syphilis the successive layers of periosteum deposited upon both sides of the bone gradually taper above and below, producing the so-called "saber" appearance. The medulla is markedly narrowed. The original bone, however, remains normal in outline. In late hereditary syphilis irregular nodules of periosteal bone are noted on the shafts of the long bones, especially on the tibia. In rickets the shaft, greatly lessened in density, becomes distorted through position and weight-bearing, and the original outline is lost.

Acquired syphilis offers a somewhat different picture from the above. The newly deposited bone is not regular in outline, but "furred," the original shaft, however, remaining clearly distinguishable from it. This new bone somewhat resembles the condition in pyogenic osteomyelitis. There is, however, a distinct difference upon closer inspection. In osteomyelitis, as its name implies, the medulla is involved, which is seen to be distended and filled with small sequestra and abscesses, the cortex is thickened and irregular, and the periosteum is in places raised from the cortex with an attempt at new bone formation. This new bone is of lesser density than the original; in syphilis it is of greater density. The endosteum is greatly disturbed and irregular. In syphilis the medulla



Fig. 3.



Fig. 4.

Fig. 3. Rachitis. Diminished density of bone; increased density on concave side of deformity; widening of epiphyseal line; tapering of diaphysis.

Fig. 4. Acquired Syphilis. Deposit of new dense bone, not smooth but "furred." Original shaft can be distinguished within it. No joint involvement.

is not involved. The more violent the inflammation within the limb, the greater the tendency to bone production in all directions.

Osteomyelitis and acquired syphilis have one factor in common—namely, the comparative freedom of joint involvement. I will omit that condition known as acute arthritis of infants which may even be considered as a secondary joint involvement. I have seen violent cases of osteomyelitis of the shaft, where loss of limb was threatened, in which the joints were not involved. Acquired syphilis has that same tendency. The joint may, in the later stages, be encroached upon, but this is a rare condition. Even here it is mainly periarticular, the joint itself being

free. In congenital syphilis this is not the case. Very frequently within the first week of a child's life disability of a large joint is the first untoward sign noticed, leading the attending physician to suspect a hitherto neglected fracture. There is a great degree of thickening out of proportion to the amount of callus formed in the few days of a disability following a fracture. There is usually a paralysis of the limb distal to the joint involved. The radiograph in these cases shows a clubbing of the shaft with an irregular fungus-appearing growth at the epiphysis. The epiphyseal line is irregular and jagged. The great amount of callus is



Fig. 5.



Fig. 6.

Fig. 5. Tuberculosis of hip. Diminished density of bone.

Fig. 6. Scorbutus. Distended joint capsule; epiphyseal separation; erosion of epiphysis and diaphysis; diminished density of shaft.

here caused by an osteochondritis. The vascular epiphysis attracts the slow spirochete of syphilis just as it does the tubercle bacillus. Here we note another condition not found in the acquired form—medullary changes. The medulla is frequently transformed into fibrous connective tissue. In these joint involvements we do not find any periosteal layer-formation as is seen in the diaphysis. The epiphysis of long bones frequently becomes separated from the shaft. This is a fracture occurring in the subchondral granulation tissue. In osteomyelitis the epiphysis may become secondarily involved. Here we see medullary changes, cortical disturbance, and the deposit of new bone beneath the periosteum which is easily distinguishable from the original dense cortex. Abscesses and sequestra are also noted. In syphilis where abscess does exist it is found in the cortex under the periosteum, in osteomyelitis in the medulla. In

acute osteomyelitis we often note a slight increase in the length of the limb. This is caused by an irritation within the epiphysis which shares in the general increase in activity of all the bone producing factors. In tuberculosis it is also occasionally seen.

The joint involvement found in congenital syphilis differs from that seen in rickets. In the former, the epiphysis is frequently entirely separated from the shaft, and an irregular fungoid mass is seen at the end of the shaft, and the epiphyseal line is jagged. In rickets, on the other hand, the epiphysis is clearly noticeable and distinct in outline, the epiphyseal line slightly irregular but well defined. The epiphysis itself is augmented in size, but of clear-cut outline. The diaphysis tapers to-



Fig. 7.



Fig. 8.

Fig. 7. Tuberculous spina ventosa. Widening of shaft with diminished density; cortex not distinguished from medulla.

Fig. 8. Syphilitic spina ventosa. Deposit of dense bone about the cortex, with line of demarcation between it and original shaft.

ward it, losing that lipped upturned-appearance found in the normal bone and becomes cup-shaped. This is produced by a deposit of bone on the diaphyseal side of the epiphyseal line. There is no squaring of the epiphysis as is observed in tuberculosis. A retardation of union of the epiphysis is also noted in rickets.

Joint involvement is also noted in scorbutus. Here we find hemorrhages beneath the periosteum and separation of the epiphyses. The joint is usually distended and the eroded and irregular epiphysis found floating within it. Scorbutus may be an accompaniment of rickets, or be independent of it.

Spina ventosa, or dactylitis, is found in both syphilitic and tuberculous

disease. They can be distinguished both clinically and radiographically. The tuberculous finger is usually knob-shaped; the syphilitic, conical. In the small long bones of the hand the rules laid down for the site of the original focus appear to be reversed. Here the tubercle bacillus attacks the shaft primarily. In the tuberculous form of dactylitis, the cortical bone is destroyed and new bone, not distinguishable from the old, is deposited. The entire shaft is widened, but is of greater radiability—*i. e.*, diminished density. In the syphilitic form the inner bone is not destroyed and the newly-deposited bone, of greater density, is easily distinguishable from the old. The medulla here is not disturbed, in the tuberculous form it is merged with the cortex.

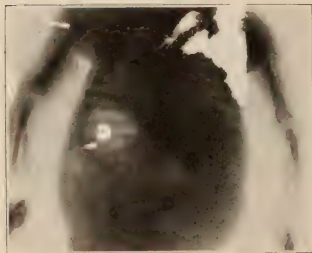


Fig. 9.



Fig. 10.

Fig. 9. Congenital Syphilis. Child four days old. Perichondritis of lower end of left humerus. Thickening of upper end but less distinct.

Fig. 10. Osteomyelitis of humerus, with secondary involvement of joint. Involved portion of shaft shows increased density, raising of periosteum with new bone of lesser density deposited underneath it; abscess and sequestra seen.

Both in rickets and in tuberculosis we note atrophy of the shaft. In rickets it is atrophy of quality—*i. e.*, density; in tuberculosis it is both of quality and size. Atrophy is caused both by disease and disuse, an immobilized diseased limb showing the greatest amount of atrophy.

Tuberculous rarification of the bone beyond the area of necrosis as distinguished from osteomyelitic eburnation is of diagnostic value.

Conclusions: In acute osteomyelitis the cortex is thickened and irregular, the periosteum is raised and new bone of lesser density is deposited underneath it. In congenital syphilis, new bone of increased density is symmetrically deposited on both sides of the shaft. In ac-

quired syphilis, this new dense bone is irregular and "furred." Abscess in osteomyelitis is found in the medulla; in syphilis within the cortex, the medulla not being involved. In osteomyelitis, the joints are rarely involved, the same condition existing in acquired syphilis. In congenital syphilis, on the contrary, joint involvement is the rule. Syphilis shows thickening on both sides of the cortex, rickets on the concavity of a bowed limb only, and with no increase in the diameter of the shaft. In syphilitic spina ventosa a periostitis with dense bone deposit is seen; in the tuberculous form the medulla and cortex are merged into one mass of soft bone. In all forms of syphilis the original outline of the bone is retained and clearly seen within the new formation; in rickets the shaft is distorted; in osteomyelitis there is a disturbance in all the layers of the shaft; in tuberculosis a merging of the cortex and medulla. Syphilitic epiphyseal enlargement is unilateral; rachitic epiphyseal enlargement, bilateral. In rickets the epiphysis is enlarged, the end of the diaphysis is widened and cup-shaped for the reception of the epiphysis, and the bone is of diminished density. In tuberculosis the epiphysis is squared and a rarified area surrounds the focus which is of indefinite outline; in osteomyelitis the focus, clearly outlined, is surrounded by a dense eburnated area.

MEDICAL AND SURGICAL PROGRESS.

FLUOROSCOPIC INVESTIGATIONS OF MEDICATION AFFECTING INTESTINAL MOTILITY.

A REVIEW OF RECENT LITERATURE.

By WM. ENGELBACH, M. D.

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Until recently the treatment for chronic constipation was experimental, one method being tried after another until by chance the one which suited the individual was discovered. This unsatisfactory state of affairs was due mainly to the fact that it was impossible to determine the actual part of the intestines in which the delay, causing the constipation, occurred. In the case of medicinal treatment, the difficulty was made greater by the lack of reliable information as to the relative effects exerted by purgatives on different parts of the alimentary canal, so that there were no clear indications as to what drug, if any, should be employed in each case. It was formerly thought that enemata could not reach beyond the splenic flexure and it was therefore assumed that constipation relieved by them was due to sluggish action of the lower part of

the colon. But recent observations have shown that fluids introduced through the rectum reach the cecum without difficulty.

Abdominal massage and hydrotherapy have been much employed in the place of drugs in the treatment of those severe forms of constipation, that do not yield to dietetic and other simple measures. Except in the cases associated with a weak abdominal wall, massage can be of use only in cases in which the accessible parts of the intestines do not functionate normally. It has, however, often been employed as a matter of routine for all cases of constipation, including many in which the inaccessible pelvic colon and rectum are alone at fault.

Finally, in severe cases of chronic constipation, the ileum has been joined to the pelvic colon or rectum, and the intervening portion of the colon has been excised. This treatment might, perhaps, be justified, if it were possible to make certain that the part of the intestines removed was the sole cause of constipation. But it was never known which part of the colon was at fault. It was not possible until after the operation to say whether the treatment suited the case. Hertz (1) attempted to determine what part of the intestines was to blame in different forms of constipation by tracing with the x -rays the passage of food mixed with a bismuth salt through the alimentary canal. In the severer cases of chronic constipation, such as those in which the question of operative interference arises, somewhat prolonged investigations were required. By comparing the results obtained by the x -rays with the clinical symptoms and signs, he says, it has become possible to recognize in many cases, by simple clinical methods, what part of the intestine is at fault. The examination of a considerable number of cases has led him to propose a new classification of the causes of constipation, based on the definitely ascertained pathogenesis of each case (2).

Attempts to discover by the x -rays and other means the exact effect of the various drugs and other measures employed in the treatment of constipation (3) have reconstructed previous laws concerning cathartics, etc.

The amount of distension in the colon depends on the diet, for vegetable food not only leaves a larger residue than animal food, but also produces a greater quantity of intestinal secretion and favors the development of larger numbers of bacteria.

The extreme importance of the mechanical stimulation of the intestines is seen in herbivora, which die if they are given insufficient cellulose; in carnivora, which require bones, and in corn-eating birds, which require sand and feathers in order to maintain their intestinal activity. In man, severe constipation results if a diet completely devoid of vegetables is taken.

Much of the activity of the intestines depends on the chemical stimulation produced by certain constituents of the food and on the products of their digestion and bacterial decomposition. Vegetable food is of much greater importance than animal food in this connection. Sugar, whether present in the food or produced in the course of digestion of starch which is itself inactive, stimulates peristalsis in the small intestine, but not in the colon, in which, however, it is rarely present, owing to its almost complete absorption before the end of the ileum is reached. Organic acids, such as formic, acetic, butyric, tartaric, citric, and lactic acids and their salts, which are either produced in the intestines by fermentation of carbohydrates, or are already present in vegetables and fruit, stimulate peristalsis, but in correspondence with its relative sluggishness the colon is less affected than the small intestine and rectum (4). The over-active

peristalsis produced by pathological excess of these acids leads to diarrhea and, at the same time, the irritation of the intestinal mucous membrane may give rise to inflammation.

Undigested animal food produces no chemical stimulation except for the extractives it contains, but even these affect only the small intestine.

Peptone acts as a feeble stimulant in the small intestine and probably the amido-acids produced at a later stage of digestion act on all parts of the gut. Of the products of putrefaction of proteins in the colon, indol and phenol are inactive, and skatol has no effect except when introduced experimentally in quantities greater than those ever occurring, even under pathological conditions, in the human intestines.

Oil increases the movements of the small intestine (5) and the products of its digestion and bacterial decomposition—glycerine, fatty acids and soaps—are comparatively powerful stimulants, which act on the colon as well as on the small intestine.

Carbon dioxid and marsh gas, produced by fermentation of carbohydrates, and sulphuretted hydrogen, produced by putrefaction (6) of proteins, actively stimulate peristalsis in all parts of the intestine. The strong intestinal movements which often occur in the moribund are due to excess of carbon dioxid and deficiency of oxygen in the blood, as carbon dioxid stimulates and oxygen inhibits peristalsis, whether they be present in the intestinal lumen or in the circulation.

Thus the mechanical and chemical stimulation of the intestinal movements is greater with a vegetable than with a meat diet. Consequently peristalsis is more vigorous in herbivorous than in carnivorous animals, and in vegetarians more than in people who take a mixed diet. Skiagraphic tracings show how the activity of all parts of the intestines is increased by the addition of vegetables to the diet.

Bile stimulates peristalsis in the colon but not in the small intestine (7); it cannot be of great importance for the bowels remain perfectly regular without the use of aperients, as demonstrated in a patient of Mayo Robson (8) with a biliary fistula, from which all the bile had escaped for sixteen months.

Pancreatic juice, water, and normal saline solution at the body temperature, have no action. Strong solutions of common salt introduced directly into the intestines give rise to intestinal movements, but taken by the mouth they have no such effect, because, as Otto (9) has shown, the pylorus remains closed until salt solutions present in the stomach become isotonic with the blood.

The movements of the colon appear to be considerably more sluggish during the night than the day. Thus in one individual in whom only eight hours were required for bismuth taken at breakfast to reach the end of the descending colon, bismuth taken at 10:30 p. m. had only reached the hepatic flexure by 10:30 the following morning. This is due to the absence during the night of the stimulation produced by food and by exercise.

Cash discovered by direct observation on a dog that exercise stimulates the intestinal movements. The effect of exercise is probably partly due to the mechanical stimulation produced by the rhythmical variations in the intra-abdominal pressure, caused by the increased respiratory excursions of the diaphragm. The movements of the abdominal muscles and of the psoas and iliacus must produce a similar effect.

Although it is well established that thermal stimuli influence the motor activity of the alimentary canal, when directly applied to the gastric or in-

testinal wall, it is not clear to what extent they can exert any action under normal conditions. A glass of cold water, taken before breakfast, undoubtedly promotes the action of the bowels in many individuals. A cold compress or douche applied to the abdominal wall appears to have a similar effect, whilst warm applications are exceedingly efficacious in diminishing the over-activity of the intestines in cases of colic. Under all these conditions the action must be reflex, as Mueller (10) found that hot and cold fluids are retained in the stomach until they reach the body temperature, and it is quite impossible for the intestines to be cooled or warmed through the abdominal muscles. In the case of the stomach, however, the intestines in immediate contact with the organ might receive a direct thermal stimulus. Cold is a stimulant of peristalsis, as a cold enema gives rise to strong contractions, which are often accompanied by colic. A hot enema seems to have a more sedative influence, but its action can hardly be compared with that of a cold one, as it is impossible to give it at a temperature more than a few degrees higher than that of the body, whereas an ice cold injection can be used without danger. Bokai (11) however showed that a rise in temperature in the blood increased the excitability of the inhibitory nerves to the stomach; hot fluids in the intestinal lumen probably have the same effect.

The mode of action and the indications for the employment of only a few of the most generally useful drugs controlled by x-ray observation, which have been recommended for constipation, are described as follows. Strychnine increases the reflex excitability of the peripheral, as well as of the central nervous system. The tone of the intestines, which probably depends to a great extent on the constant slight stimulation of Auerbach's plexus, the peripheral nerve center situated in the muscular coat, is therefore increased by strychnine. At the same time the increased excitability of Auerbach's plexus causes the action of purgatives and diet, which act by means of a peripheral reflex, to be more effective. Hence in those forms of constipation that depend on depression of the central and peripheral nervous system, strychnine and *nux vomica* are of great value, whether given alone, or in combination with vegetable saline aperients.

Experiments on animals have shown that atropin paralyses the nerve endings of the vagus and peripheral nerves of involuntary muscles. Hence, its action on the intestinal musculature is to diminish its tone and contractile force, and to regulate the intestinal movements, if they were previously irregular. It has long been known that atropin exerts a sedative action on intestinal colic. The violent spasmodic contractions of various lengths of the intestines above the seat of obstruction were abolished, as shown by the disappearance of the colic and of the movements which have been previously seen on the screen, after the administration of belladonna. Atropin is therefore of use in cases of spastic constipation and mucomembranous colitis, as it diminishes the excessive excitability of the peripheral nerve centers and so permits orderly intestinal contractions to return. Trousseau (12) strongly recommended belladonna in the treatment of constipation, and ascribed its introduction for this condition to Bretonneau. When given alone in other forms of constipation, it is of little value, so that it is probable that the patients who were relieved by it, were affected by spastic constipation.

Opium is of value in those cases of constipation which are associated with pain, especially when it results from disease of the pelvic or abdominal viscera. The analgesic effect of opium and its paralysing action on the

central nervous system, which leads to a diminution in the reflex activity of the inhibitory nerves to the intestines, may result in the bowels being opened. In spastic constipation opium is at first even more effective than atropin, but as the condition is often chronic or recurrent, it is advisable to employ it as little as possible. Opium, morphine, and codeine may, therefore, be used in acute painful conditions associated with constipation, such as biliary and renal colic, and in rapidly curable forms of intestinal colic such as that due to lead poisoning. Especially in the latter condition they are most effective when given in combination with a saline purgative.

Pilocarpine and physostigmine directly stimulate the motor and secretory nerve endings of the intestines, and to a less extent the muscle fibres themselves. They therefore act as powerful purgatives, but only when given in a dose sufficient to produce unpleasant effects in other parts of the body. Physostigmine, however, has recently been recommended in cases of acute intestinal paralysis, both with and without peritonitis. It has the advantage of acting when injected subcutaneously, so that it can be given even when there is persistent vomiting; 1/100 grain of the salicylate should be used. It is, however, generally less likely to be effective than atropine injections or veronal given by mouth or rectum, because in the majority of such cases the paralysis is only apparent, the condition being really one of active inhibition, which must be overcome by sedatives.

Vegetable purgatives irritate the intestinal mucous membrane and thereby give rise to a local reflex in Auerbach's plexus, which results in increased motor activity. This diminishes the time during which absorption of fluids taken by mouth or passed into the alimentary canal can take place; there is no evidence to show that vegetable purgatives stimulate the secretion of the digestive juices. Those most commonly used do not irritate the stomach, as some, such as aloes, only act after they have become dissolved by the bile, and others, such as castor oil, by pancreatic ferments. Vegetable purgatives are generally supposed to act on both the large and small intestines; x-ray observations show that this is true in the case of cascara sagrada, and Magnus (13) in his experiments on cats, confirmed the belief with regard to castor oil, but found that senna acted only on the large intestine.

The investigations of Hiller (14) and of Kohlstock (15) show that the subcutaneous injection of vegetable purgatives produces considerable local pain, even when cocaine is added to the solution, and the result is so uncertain, and there is so much danger of toxic effects on other organs, that it is inadvisable to employ this method of administration, even when a patient is vomiting or comatose. Under such circumstances the administration of certain purgatives by the rectum may be tried.

Aloes, cascara sagrada, senna, and rhubarb, owe their purgative action to certain irritant compounds of anthracene. A considerable quantity of tannic acid is present in rhubarb, so that its aperient action is generally followed by constipation; for this reason it is not suitable for regular use in chronic cases.

Aloes is perhaps the most frequently useful of all purgatives. In many cases it can be taken regularly for years without producing any bad result and without losing its efficacy. Aloes acts more slowly than any other aperient, requiring as a rule, ten or twelve hours to produce a result. It is commonly supposed to irritate the rectum, but the evidence that it does so to any considerable extent is not very conclusive. It is, however, well to avoid using it when hemorrhoids are present, and unlike all other aper-

ients, it may sometimes prove useful in very slight cases of painful defecation.

The action of aloes is said to be increased by the addition of iron salts. It is therefore often prescribed with a grain of ferrous sulphate. It is not clear, however, that the iron is really of value, except in the constipation of chlorosis, when it acts on the cause of the constipation. It has already been explained how the efficacy of vegetable purgatives can be increased by the addition of *nux vomica* and *belladonna*; one of the best pills for use in chronic constipation is composed of half a grain each of the extracts of *nux vomica* and *belladonna* combined with aloes. The dose of this is about the same as that of aloes. When it is necessary for a purgative to be taken regularly for long periods, it is a good plan to give *casarea* and aloes pill alternately for a week at a time.

Castor oil is itself not an irritant and has no effect on the stomach. It is split up by the steapsin of the pancreatic juice into glycerine and ricinoleic acid; the latter and its sodium salt irritate the intestines and cause purging, which is unaccompanied by griping. Unless it is retained sufficiently long for bacterial decomposition to occur, it has no advantage over olive oil when given by the rectum. The fatty acid and soap produced when it is given by the mouth are absorbed from the intestine, so that the oil is utilized by the body as a food, and in China it is actually taken as an article of diet. On account of its mild but certain action and the absence of griping, castor oil is perhaps the most valuable of all purgatives for occasional use, a dose of half an ounce or an ounce being generally required. The regular administration of half an ounce at night, or night and morning, is one of the best methods of treating senile constipation and muco-membranous colitis, especially when opium or *belladonna* is given simultaneously. The great disadvantage of castor oil is its taste, which, however, is comparatively slight in the best preparations. The taste is mainly due to its smell; it can therefore be overcome to some extent by holding the nose. The unpleasant after-taste, which is due to traces left in the mouth, is diminished if the mouth is previously moistened with lemon juice, brandy, or peppermint water. Small doses may be taken with an equal quantity of glycerine or in capsules containing half a drachm, but the latter are too bulky for some people to swallow. Larger doses are best taken in one gulp with lemon juice or peppermint water with which the medicine glass should also be rinsed before pouring in the oil.

Mercurial purgatives should never be employed in the treatment of chronic constipation, as they produce too much irritation of the intestinal mucous membrane, and their constant use is likely to result in symptoms of mercurial poisoning. The regular use of grey powder for constipation of infants is, however, strongly recommended by Still.

It might be supposed that the form of constipation due to absorption through the intestine being so active that very little feces remain to be excreted, required no treatment. But the occurrence of symptoms in severe cases makes it probable that the small quantity of feces formed remains so long in the intestines before sufficient accumulates in the pelvic colon to produce an effective stimulus to defecation, that an abnormally large proportion of the poisonous constituents of the feces is absorbed. It is, therefore, advisable to attempt to obtain an evacuation every day or on alternate days.

Adolph Schmidt (16) and Neville Wood (17) independently came to the conclusion that this could be done by the administration of some sub-

stance that passes through the intestines without undergoing decomposition or absorption. Schmidt recommends more particularly agar-agar; he also, has suggested the use of paraffin, which Wood had already given for the purpose. The use of bread made with wood shavings has been advocated in Germany. Agar-agar is prepared from certain East India seaweeds, and consists mainly of semi-cellulose, which is unaffected by the digestive juices and is for the most part unabsorbed. Lohrish, working under Schmidt's direction, found that it also diminished the absorption of the food, especially cellulose. It readily absorbs water, each drachm taking up about 100 c.c. so that a comparatively small quantity taken by mouth yields a considerable volume of material for excretion. The ordinary dose is one teaspoonful, which should be taken in mashed potatoes or with stewed apples at the mid-day meal. Sometimes the dose has to be increased, but it is rare for more than half an ounce to be required. The larger doses should be divided among the different meals. Pure agar-agar can be obtained as an almost tasteless, non-irritant powder, but Schmidt recommends the addition of a small quantity of cascara sagrada, in order to replace the stimulating decomposition products of the food, which are present in these cases in an abnormally small amount. The dose of cascara is quite sufficient by itself to produce any purgative action. The combination of agar-agar with cascara is sold under the name of regulin. When regulin acts favorably, it first appears in the stool after three or four days; it is generally advisable to begin the treatment with an ordinary purgative or an enema. Schmidt found that about two-thirds of the cases of constipation that he treated with regulin, improved; in some, treatment for only one or two weeks was required, but in others the use of regulin had to be continued permanently. The chief disadvantage of regulin is the unpleasant bitter taste given to it by the cascara, so that it is not easy to persuade patients to take more than a teaspoonful of it in a day. In rare cases regulin may apparently give rise to very serious symptoms. Liquid paraffin is not absorbed in the alimentary canal; it is non-irritating and seems never to have produced any unpleasant symptoms. It is disagreeable to take, however, and is best prescribed with a few drops of some aromatic oil. From one to six drachms should be given, divided into two or three doses; sometimes the dose may be gradually reduced until a single dose of a drachm is taken every night. It is particularly valuable when the feces are very hard and dry; it is therefore useful in certain other forms of constipation besides that due to excessive digestion of food, for example in diabetes. In dyschesia also the soft stools that result from its use, are expelled with less difficulty than ordinary feces. Schmidt recommends the addition of a small quantity of cascara to the paraffin, the mixture being known as pararegulin; its taste, however, is so unpleasant that it has to be given in capsules, and as six or eight are required in a day, it is not a convenient remedy.

Although agar-agar and paraffin are undoubtedly useful in some cases of constipation due to the loss of residual feces, the slighter forms are much more rationally treated by diet alone, as an increase in the quantity of indigestible material in the food not only of itself adds to the bulk of the feces, but also increases the secretion of intestinal juice, and thus adds to the quantity of stimulating decomposition-products in the intestine by providing a more abundant culture-medium for the intestinal flora.

HEMIANOPSIA.

A REVIEW OF RECENT LITERATURE.

By JOHN GREEN, JR., M. D.

1. CONTRIBUTION TO THE TOPICAL DIAGNOSIS OF HEMI-ANOPSIA.—Carl Behr (*v. Graefe's Archiv. f. Ophthalmologic Bd. LXX., Heft, 2, April 13, 1909*).
2. A CASE OF TRAUMATIC CORTICAL HEMI-ANOPSIA.—R. Possek (*Zeitschr. f. Augenheilk. Ergänzungsheft, 1905*).
3. A CASE OF BITEMPORAL HEMI-ANOPSIA.—N. Voorhoeve (*Ned. Tydschrift Voor Geneeskunde, 1908, No. 8*).
4. PURULENT CEREBRO-SPINAL MENINGITIS, WITH HEMI-ANOPSIA AND HEMI-ANOPIC PUPIL REACTION.—S. Ginsberg and P. Dessauer (*Centrbl. f. prak. Augenheilk, February, 1909*).
5. ON A CASE OF BITEMPORAL HEMI-ANOPSIA.—G. Stanculeanu (*Archives Ophthalmologic, May, 1909*).

In differentiating between tractus hemianopsia and that due to lesions of the cortex, the final determination has often rested upon the so-called Wernicke hemianopic pupillary test. This test is made by projecting a very small pencil of light upon the blind half of the retina; if, under these circumstances, the pupil reacts, it indicates that the optical connection between the retina and external geniculate body is intact and hence that the lesion is cortical; *per contra*, if, under the conditions named above, the pupil fails to contract, the lesion must be situated in the optic nerves and tracts or in those portions of the basal ganglia which are concerned with vision. The test, even in the hands of experts, frequently yields unsatisfactory, even contradictory, results, due, in large measure, to the unavoidable diffusion of light to the seeing half of the retina.

Recently Willbrand has proposed the following substitute: The patient is requested to fix a white point on a large gray surface 30 cm. distant. Then, suddenly, both eyes are covered with equal prisms, apex toward the side of the hemianopic defect. The refracting angle must be twice the angle of the remaining active portion round the point of fixation, or more, so that the image is thrown upon the hemianopic portion. The test presupposes the existence of a subcortical link between the retina and eye movements near the external geniculate body, similar to the pupil reflex. Should the prism test be positive, this proves that the optical connection between retina and external geniculate body remains uninjured. In any interruption of this connection, the involuntary associated eye movement will be wanting.

Before the Section on Ophthalmology of the American Medical Association, Dr. Alfred Saenger demonstrated this test on one of my patients with right homonymous hemianopsia following head injury. The question as to whether the hemianopsia was due to a tractus or cortical lesion had not been satisfactorily answered by the Wernicke test. The sharp

lateral motion of the eyes when the object fixed was displaced by the prisms to the blind halves of the retinas, showed conclusively that there was no interruption in the optical connection between the retina and external geniculate body; in other words, that the hemianopsia was of cortical origin.

Behr (1) in an important paper based upon the clinical material of the clinic at Kiel endeavors to throw some light on still obscure problems of hemianopsia. He deals especially with the relative importance of the hemianopic pupillary reaction and of Willbrand's prism test for the localization of injury, on the nature and origin of the overlapping macular field, the nature of the color perception center, the localization of optic memory, and also of the extent to which the optic nerve fibres undergo atrophy in case of central causation. He concludes that (1) hemianopic reaction of the pupil is always present in tractus hemianopsia; (2) a negative result with Willbrand's prism reaction also proves the tractus seat; (3) atrophy of the disk is seen in intracerebral localization only if the hemianopsia has been acquired in earliest infancy. It is most marked on the homonymous side. In these cases the eye with the larger peripheral field takes the lead in the visual act and the other one becomes more or less amblyopic; (4) the "overlapping" field is confined to the macular region; it is rarely absent in intracerebral hemianopsia but also mostly present in tractus hemianopsia. Central vision and preservation of the macular field are interdependent; if the latter is wanting the vision is reduced to one-half or one-third; (5) difference of pupil and lid aperture (wider on side of hemianopsia) if combined with homonymous hemianopsia, may possibly confirm the diagnosis of tractus hemianopsia; (6) there is no necessity to assume an isolated color perception centre; color hemianopsia has no topical diagnostic importance. The centre for optic memory lies within one hemisphere in either the occipital or the temporal lobe, mostly on the left side; (7) the nasal half of the retina is possessed of a larger amount of pupillo-motor activity.

A case of traumatic cortical hemianopsia is related by Possek (2). His patient received a severe blow on the occipital region which caused a depressed fracture. Blindness followed operation. Gradual recovery up to V equal 6/12, either eye, but associated with left homonymous hemianopsia.

Voorhoeve's (3) patient had intense headache, slow pulse rate, vomiting, and increased intracranial tension. There was bitemporal hemianopsia, with the limits of the field going through the point of fixation. One remarkable peculiarity was that the so-called "superfluous part of the field" (that small part of the field which in hemianopsia still exists on the other side of the vertical line of separation of the blinded and the normal half) was found to be present only for the periphery, not for the central part of the field. X-ray examination showed an enlargement in the region of the sella turcica. The signs, therefore, pointed to tumor of the anterior part of the chiasm. During several months that the patient was under observation, there was no change in his condition.

Especial ophthalmologic interest attaches to a case of cerebro-spinal meningitis reported by Ginsberg and Dessauer (4). Recovery ensued after two injections of antimeningococcus serum. During the course of the disease, vision in both eyes became impaired and on discharge, R. V. equal fingers at 15 cm. excentrically outward; L. V. plus $2\frac{1}{5}$ with a deficiency of the outer half of the field. There was, therefore, a left homonymous hemianopsia and the hemianopic pupil reflex was elicited.

The reflex lasted for four weeks and then gradually disappeared. Finally the pupils only contracted to light directly incident on the macular region. Convergence reaction good. The central scotoma gradually cleared, vision improved, but the fields remained hemianopic.

The site of the lesion was assumed to be in front and to the left of the chiasm. Its nature was not certainly determined; hemorrhage, thrombosis, or possibly a localized encephal meningitis.

A case of hemianopsia which ended in partial recovery under anti-syphilitic treatment is reported by Stanculeanu (5). Pressure upon the chiasm by an exostosis of syphilitic origin arising from the sella turcica was assumed to be the causative lesion.

ROENTGEN PYELOGRAPHY AND URETEROGRAPHY.

A REVIEW OF RECENT LITERATURE.

By EDWARD HOLMAN SKINNER, M. D., Kansas City, Mo.

1. RÖNTGENOGRAPHIE DES NIERENBECKENS NACH COLLARGOL FÜLLUNG.—Völker und v. Lichtenberg (*Münch. Med. Woch.*, 1906, Nr. 3, p. 105).
2. PYELOGRAPHY.—Lichtenberg und Völker (*Kongress der Röntgen-gesellschaft*, Berlin, April 3, 1910).
3. RÖNTGENDIAGNOSTIK DES UROPOETISCHEN SYSTEMS.—Dr. G. Fedor Haenisch, 1909.
4. DEFORMITIES OF THE RENAL PELVIS.—W. F. Braasch (*Annals of Surgery*, March, 1910, Vol. LI., No. 4).
5. COMBINED CYSTOSCOPIC AND RÖNTGENOGRAPHIC EXAMINATION OF KIDNEYS AND URETER.—Dr. A. A. Uhle, Dr. G. E. Pfahler, Dr. W. H. MacKinney, Dr. A. G. Miller (*Annals of Surgery*, March, 1910, Vol. LI., No. 4).
6. ANATOMIC, PATHOLOGIC AND CLINICAL STUDIES OF LESIONS INVOLVING THE APPENDIX AND RIGHT URETER, WITH SPECIAL REFERENCE TO DIAGNOSIS AND OPERATIVE TREATMENT.—Dr. J. Y. Brown, Dr. W. Engelbach, Dr. R. D. Carman (*J. A. M. A.*, May 7, 1910, Vol. LIV., No. 19).

The possibilities of the röntgen ray in kidney and ureteral diagnosis afford assistance beyond the already established field of calculus. The injection of opaque media into the kidney pelvis provides a new means of diagnosis in renal anatomy and pathology. Prior to 1906 attempts had been made to outline the kidney pelvis and ureters by the injection of bismuth emulsions, but with quite limited success. Völker and Lichtenberg then proposed the injection of argentum colloidal in solutions of two to five per cent. They have continued these researches with a five per cent. collargol solution upon some one hundred patients with no untoward effects. Haenisch recommends that the diagnostic solution be drained from the kidneys after x-ray negatives have been taken, and that it be followed by a boric acid solution; but later American workers, cited above, do not consider this of enough moment for mention. It appears to the reviewer that the natural drainage of the urinary channel should be sufficient; furthermore, there should hardly be any untoward effects of such diagnostic solutions on a comparatively healthy urinary channel and they should have a beneficial effect on most inflammatory conditions.

Braasch has comprehensively described the fields of opaque injections for the radiographic diagnosis of renal and ureteral pathology. The technique of Braasch differs from that of Völker and Lichtenberg, in that Braasch uses a 10 per cent. solution of collargol, which is a saturated solution. The report of Braasch includes radiographic evidence on the variations of the normal kidney pelvis; hydronephrosis, hydronephromata, localization of renal calculus within or without the renal pelvis, hydro-

ureter, essential hematuria, solitary kidney and tumor differentiation. To this list others have added the radiographic evidence of renal ptosis, alterations in the position, size, and shape of the ureters and bladder, and the amount of destruction of kidney substance. Braasch reports also two cases in which the etiological factor of the pelvic dilatation was demonstrated. In the one case, there was a marked scoliosis involving the second lumbar vertebra opposite the enlarged kidney pelvis, which, at operation, proved to be a band of tissue constricting the ureter, as a result of a paravertebral inflammatory process. In the second case there was an anomalous renal blood vessel constricting the ureter at the level of the lower pole of the kidney, the usual site of such anomalies. This produces an elongated or pear-shaped dilatation of the renal pelvis.

In the localization of a kidney stone, it is obvious that the study of the röntgen negative would demonstrate whether the calculus shadow was without the adjacent shadow of the renal pelvis filled with the opaque solution, or, if the stone was within the pelvis, its shadow would be obliterated or dimmed by the diagnostic fluid. Braasch proceeds to demonstrate the superiority of the radiographic evidence of hydronephrosis over the method of Kelly, *i. e.*, the determination of the amount of fluid injected into the pelvis necessary to produce artificial renal colic. It is contended that the method of Kelly permits of faulty interpretation of findings, generally, and is particularly doubtful in small dilatations and cases with impassable ureteral obstructions. The radiographic outlines of a kidney pelvis, in black and white, are more satisfactory.

The co-relation of the cystoscopic and röntgen examination to accurate diagnosis of the urinary tract attracts attention. The cystoscope gives us information regarding the macroscopic pathology of the bladder and ureteral orifices and provides for the examination of the separated urine. The ureteral catheterization lends an accuracy that is greatly enhanced by the röntgen negative of the catheter *in situ*. By the combined methods we may demonstrate the passage of the catheter to the kidney; the evidence of stone within or without the ureter; the point of obstruction to the passage of the catheter, and the etiological factors in anomalous or pathological anatomy deduced therefrom; a diverticulum or double ureter; kinks or abdominal tortuosity of the ureters, etc.

The technique of the ureteral injection of colloidal silver by the gravity method of Uhle and Pfahler, is as follows: "The buttocks of the patient are elevated and the ureteral catheter is introduced for a distance of about three inches. The warmed solution is allowed to flow by gravity from a graduated burette, which is connected with the ureteral catheter by means of a rubber tubing to which is attached a small cannula. Then with a force of gravity of about two feet the fluid is allowed to flow. The solution flows at times evenly and at other times intermittently, but finally it comes to a standstill, which is taken as an indication of complete filling of the ureter and pelvis of the kidney."

The cystoscopist will hardly admit that there is sufficient danger in the use of the ureteral catheter to restrain its employment in the least. That there has been some complaint among surgeons is verified by the attempt to invent a means of the exact localization of pelvic radiographic shadows without the introduction of the catheter. Carman has utilized the rectal sound as an indicator. It is an anatomic supposition that a rectal sound, when introduced with the tip resting at the first sacral vertebra, is in a transverse plane with the normal ureter. With this hypothesis as a basis of calculation, the relation of these shadows in stereoscopic röntgen nega-

tives to the ureteral lumen is estimated. The method is extremely interesting but, as it is asserted, demands further study and investigation before such a transverse plane of rectum and ureter can be declared an anatomic constant. Awaiting such a decision, however, it is well to content ourselves with the styleted catheter for the differential diagnosis between the pelvic shadows of calculus, phlebolith, calcified gland, enteroliths, etc. The small number of untoward results and the diagnostic advantage of ureteral catheterization will demand its use until the exactness of other methods is demonstrated to lead to relatively satisfactory conclusiveness.

BACTERINS, VACCINES AND SERUMS.

A REVIEW OF RECENT LITERATURE.

By NOBLE P. BARNES, M. D., of Washington, D. C.

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2. THE ACTION OF ANTIDIPHThERITIC SERUM IN OCULAR INFECTIONS.—M. A. Darier (*Le Presse Médicale*, January, 1908).
3. PUERPERAL SEPTICEMIA TREATED WITH DIPHTHERIA ANTITOXIN.—RECOVERY.—E. M. Deacon (*Med. Rec.*, January 8, 1910).
4. WHITFIELD (*Wisconsin Medical Journal*, January, 1909).
5. UNTOWARD RESULTS FROM DIPHTHERIA ANTITOXIN WITH SPECIAL REFERENCE TO ITS RELATION TO ASTHMA.—H. F. Gillette (*Ther. Gazette*, March, 1909).
6. THREATENING COLLAPSE AFTER INJECTION OF DIPHTHERIA ANTITOXIN.—Arent de Besche (*Berl. klin. Wochenschrift*, August 30, 1909).
7. ORAL ADMINISTRATION OF ANTITOXIN.—McClintock and King (*Jour. Infect. Dis.*, February 18, 1909).
8. FLEISCHER (Russkii Vrache, September 12, 1909).
9. TETANUS DEVELOPING TWELVE DAYS AFTER SHORTENING THE ROUND LIGAMENT.—RECOVERY.—R. Peterson (*Jour. A. M. A.*, January 8, 1910).
10. TETANUS WITH CASE REPORTS AND DEMONSTRATIONS.—Kinyen (Therapeutic Society, D. C., December, 1909).
11. THE PRESENT STATUS OF THE SERUM THERAPY OF EPIDEMIC CEREBROSPINAL MENINGITIS.—Simon Flexner (*Jour. A. M. A.*, October 30, 1909).
12. DISCUSSION—REPORT OF CASES OF MENINGITIS IN CHILDREN'S HOSPITAL, BOSTON.—Thomas M. Rotch (*Jour. A. M. A.*, October 30, 1909).
13. EPIDEMIC MENINGITIS.—T. Overton (*Tenn. State Med. Assoc.*, September, 1909).
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15. CHANTEMESSE (*Hyg. gén. et appliq.*, 1907, p. 577).
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18. SERTHERAPY AND ITS DANGERS.—E. Scheidemandel (*Muen. med. Woch.*, October 26, 1909).
19. ANTIVENINS.—H. Noguchi (*Jour. A. M. A.*, January 22, 1910).
20. ANTISERUM FOR SCORPION VENOM.—C. Todd (*Jour. Hyg.*, April, 1909).

21. STATUS OF THERAPY BY ANTIGONOCOCCUS SERUM, GONOCOCCUS BACTERIN AND PYOCYANEUS BACTERIN.—B. A. Thomas (*Jour. A. M. A.*, January 22, 1910).
22. THERAPEUTIC VALUE OF ANTIGONOCOCCUS SERUM AND GONOCOCCUS BACTERINS.—G. K. Swinburn (*Med. Rec.*, October 23, 1909).
23. McMaster (*Merck's Archives*, May, 1909).
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25. AN INTERESTING CASE OF GONORRHEAL ARTHRITIS TREATED WITH SERUM.—H. E. Plummer (*Vermont Med. Monthly*, March 15, 1909).
26. BENEFIT OF POLYVALENT ANTIDYSENTERY SERUM IN DYSENTERY IN CHILDREN.—P. Coyne and B. Auché (*Jour. de Med. de Bordeaux*, August 15-22, 1909).
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34. TUBERCULIN IN OPHTHALMIC PRACTICE.—L. C. Peter (*Med. Rec.*, January 1, 1910).
35. TUBERCULIN VASELIN FOR THE OCULAR REACTIONS.—A. Wolff-Eisner (*Muen. med. Woch.*, November 10, 1909).
36. TUBERCULIN REACTION IN SKIN AND EYE.—C. McNeil (*Brit. Med.*, November 6, 1909).
37. TEST OF TUBERCULIN IMMUNITY ON NEW PRINCIPLE.—E. Lowenstein (*Ther. Monatsch.*, Berlin, November, 1908).
38. TUBERCULIN TREATMENT OF PULMONARY TUBERCULOSIS.—P. K. Pel (*Klinische Wochenschrift*, September 20, 1909).
39. PULMONARY TUBERCULOSIS, TREATED IN ASHEVILLE CLIMATE.—J. A. Buifroughs (*Charlotte Med. J.*, April, 1909).
40. TWELVE YEARS OF PULMONARY TUBERCULOSIS TREATMENT IN THE WEST.—E. S. Bullock, C. T. Sands (*Jour. A. M. A.*, June 19, 1909).
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43. DISCUSSION OF BALDWIN'S "GENERAL PRINCIPLES OF TUBERCULIN DIAGNOSIS AND TREATMENT."—Theodore Potter (*Jour. A. M. A.*, January 22, 1910).

44. THE TREATMENT OF ERYSIPELAS BY INOCULATIONS WITH A SPECIFIC VACCINE.—G. W. Ross and W. J. Johnson (*Jour. A. M. A.*, March 6, 1909).
45. BACTERIAL VACCINES IN ACUTE RHEUMATISM.—G. A. Person (*N. Y. Med. Jour.*, December 15, 1909).
46. VACCINE TREATMENT OF LOBAR PNEUMONIA.—Wilcox, Morgan and Leary (*Boston Med. and Surg. Jour.*, November 11).
47. THE TREATMENT OF PELVIC INFECTION WITH SPECIAL REFERENCE TO BACTERIAL VACCINES.—F. R. Oastler (*Med. Rec.*, November 27, 1909).
48. TREATMENT OF SEPSIS WITH BACTERIAL VACCINES.—H. F. Hartwell, E. C. Streeter and R. M. Greene (*Sur. Gyn. and Obstet.*, September, 1909).

Of the many remedial agents introduced into modern therapy none possibly are more interesting than the important groups of bacterial vaccines and serums. They present three distinctive advantages to the modern Aesculapius. They aid in effecting, first, specific cures; second, proved prophylaxis, and third, distinctive diagnoses.

Beginning with serums and taking up first the most important of the group, antidiphtheritic serum—which more than ten years ago passed the period of experiment and debate—became an established and approved therapeutic method and is to-day regarded as the only rational method of combating the once dreaded disease. A marked improvement in the serum has followed the discovery that the antitoxic properties could be precipitated with the proteid-like bodies or globulins and filtered out, dried, and then dialyzed, resulting in a clear liquid of the same density as blood. This liquid, after filtration and standardization, is in every way superior to the old. The globulins of this product being again precipitated and dried, are marketed as a permanent, concentrated antitoxin. The convenience of this dry and permanent product for country practitioners, for the army and navy, and for isolated mining and lumber camps, is inestimable.

The nonspecific use of this serum is every day more extensive. Fernandez (1), in a recent review, states that suppurative keratitis of whatever origin is always favorably influenced by this serum. In his clinic at Havana every case thus treated has recovered promptly.

Darier (2) affirms that in the infectious ulcers of the cornea, in the infections by penetrating wounds of the eyes, in the serious complications that sometimes arise after cataract operation, in cases of infectious iritis, etc., the affection is rapidly checked by two or three injections. In these cases there is noted, first, the absence of pain, and afterwards, rapid recovery, as a rule, with remaining vision, which is better the earlier the serum is administered.

Deacon (3) reports a case of puerperal septicemia treated with diphtheria antitoxin. The case was instrumental, perineum lacerated but with immediate repair; on the third day the temperature was 100 degrees F., lochia were normal; 5 per cent. phenol douches were given. Fifth day, pain, tenderness, chilliness; temperature 101 degrees F. Sixth day, severe headache, abdomen distended, temperature 103 degrees F.; curetting under chloroform anesthesia and irrigation with hot creolin, 1 drachm to 2 pints. Ung. Credé was applied to abdomen and thighs morning and evening; calcium sulphide, $\frac{1}{2}$ grain every 2 hours and magnesium sulphate freely were administered; high enemata of hot water and turpentine

were given. Ice bag on abdomen. This treatment was continued until the 12th day when the temperature was 105.5 degrees F., pulse 160, abdomen enormously distended, chills, pain, discharge profuse and purulent. On this day 9,000 units of diphtheria antitoxin were used.

The concluding paragraph is as follows:

"The prompt action of diphtheria antitoxin in stopping the suppurative process in this case leads me to venture the opinion that it will be equally valuable in all septic conditions of a profound type, not only those occurring during abortion and parturition at full term, but also those due to infected wounds in any part of the body. In using antitoxin in these cases, it must be used fearlessly and persistently. A total of seventy thousand units was used in the case which I have just reported, and at this writing, October 18, 1909, the patient is in the best of health, and she has never experienced any ill effect whatever from the treatment."

Whitfield (4) reports the use of antidiphtheritic serum in severe cases of grippe. The patients, he states, experienced almost immediate relief from the physical and mental depression. One of the patients, a man with chronic albuminuria and glycosuria, received 6,000 units in 48 hours, and not only was he relieved of his influenza but his urine became free from sugar and showed only a trace of albumin.

Cases of asthma, bronchopneumonia, influenzal pneumonia, and various forms of infections have been reported as cured or favorably influenced by the serum. The unpleasant effects of the serum have been reviewed by Gillette (5). He collected 28 cases in all, in which collapse or death had followed the administration of horse serum. Of these 15 died. He notes that some of these cases experienced an irritation of the mucous membrane of the eyes, nose and throat, and some had asthma when about a horse or stable.

Idiosyncrasies in regard to certain odors are not infrequent and in this respect require recognition. Arent de Besche (6) gives the following personal experience: "As long as he could remember he had been unable to drive behind a horse in an open carriage or to remain in a stable for more than a few minutes without experiencing an attack closely resembling hay fever. This applied to the odor of horses only. Until he was thirty years of age this peculiarity was nothing more than distinctly disagreeable. At that age, however, it came near costing him his life. While in perfectly good health he was exposed to diphtheria, and as a result, for the first time in his life, submitted to an injection of 1,000 units of antitoxin in 2 c.c. of horse serum. Five minutes later he was affected with marked itching in the nose, running from the eyes, and almost incessant sneezing. He then began to cough and within ten minutes became markedly dyspneic and cyanotic, the attack resembling severe asthma. He felt weak and ill, had a chill, and his legs and arms were cold; his pulse was not palpable. He remained critically ill for two hours, after which the condition cleared up so rapidly that five hours from the onset the patient felt quite himself again." A point of considerable interest in this case is that this acute attack brought on by the horse serum produced a definite immunity in the patient to the milder type of attack from which he had suffered previously when exposed to the odor of horses. This lasted for three months, during which time he was able to drive behind horses or remain for long periods in stables with perfect comfort. At the end of that period the immunity gradually disappeared and the susceptibility to the odors returned.

Though usually rendered inert by the digestive processes when given by the mouth, McClintock and King (7) give the following method of in-

hibiting digestion, whereby the oral administration, especially in children, has given uniform and satisfactory results. "One-half hour before administering the serum the child is given one glass of a 1 per cent. sodium bicarbonate solution. When the antitoxin is given there is added to it one minim of fluid extract of opium and from four to ten minims of a saturated solution of salol in chloroform. No food should be given for at least four hours before administering the serum." In 19 children, and in hundreds of animals used experimentally, there was no evidence of "serum sickness or anaphylaxis." These authors believe the oral method of administering the antitoxins of tetanus and diphtheria is the preferable one for prophylaxis; first, on account of absence of danger and the ease of administration; second, because, the cost may be materially lessened. The hypodermic method for curative purposes is the only one to be recommended, unless extensive clinical experience should show the oral method to be equally efficacious. As an adjuvant to the treatment of diphtheria a serum prepared by Wasserman, in 1902, and since advocated by Fleischer (8) is intended to act on the bacilli. The specific serum is made by immunizing dogs with diphtheria bacilli of graded virulence and then preparing the serum in the form of tablets. Comparing its effects with simple swabbing of the pharynx with a solution of bichloride in glycerin and water, he found that the latter method differed very much in its effectiveness, depending on the shape of the tonsils, those with numerous irregularities protecting the bacilli from the action of the antiseptic. On the other hand, patients treated with the specific serum in the form of tablets became free from bacilli in a short time, quite without any relation to the anatomical peculiarities of the lymphatic apparatus of the pharynx. The quarantine period after recovery from disease was shortened in their cases to from two to five days, while the patients treated by swabbing with antiseptic solutions harbored bacilli from one to three weeks.

TETANUS.

Peterson (9) reporting 150 cases of post-operative tetanus gives the incubation period as about eight days. As explained by Kinyoun (10) the shorter the incubation period the more virulent and active the disease. Peterson, like all other writers, emphasizes the importance of early administration of antitetanic serum to act on the toxins before they become fixed in the nerve cells. The mortality of these postoperative cases has been reduced ten per cent. by the use of the serum. To put it briefly, it may be stated that the value of tetanus antitoxin as a prophylactic agent is very great, and as a curative agent it is of undoubted value when properly used. Many physicians do not distinguish between the results obtained by the prophylactic and those by the curative use of tetanus antitoxin; and the failure of the latter has oftentimes been erroneously assumed to apply to the former.

The best example of using tetanus antitoxin for preventive purposes is furnished by veterinarians. The results are so striking that now antitoxin prophylaxis is invariably used to prevent epidemic outbreaks of tetanus in horses. In stables where several cases developed every year, the administration of prophylactic doses of antitoxin given to all horses who had received wounds prevented the development of a single case of tetanus.

The Society of Surgery of Paris recently reported that in a group of Paris hospitals there had occurred in the last seven years but eleven cases of tetanus, all of which were in persons who, by some mischance, had not

received the customary preventive dose of antitetanus serum, which is the routine practice there after a street accident. In Germany it is considered a grave error on the part of the physician to fail to use this measure in a case of injury which is contaminated by street dirt. So in the light of our present knowledge to neglect to use this antitoxin as a curative agent is not giving our patient the benefit of every therapeutic measure, and to neglect to use it as a preventive agent is inexcusable negligence.

EPIDEMIC CEREBROSPINAL MENINGITIS.

Respecting the present status of the serum therapy of epidemic cerebrospinal meningitis, Flexner (11) says in his last report: "I still advise caution in concluding that the case has been proved for the serum." Of the 712 cases tabulated the average mortality in all age periods was 31.4 per cent. The highest mortality is shown in the first two years of life, being 42.3 per cent., but this is a marked improvement over the old mortality rate under previous forms of treatment, which was 90 per cent. The result in the first two years of life, when the injections were given in the first three days of the disease, gave the remarkably low mortality of 5.8 per cent.

Rotch (12) reported the cases occurring in the Children's Hospital, Boston, for ten years, averaging twenty cases each year, with a mortality varying from 60 to 80 per cent. From November 1, 1907, to November 1, 1908, by the employment of the Flexner serum the mortality fell to 19 per cent and since then has never gone above 25 per cent.

Overton (13) reports seventeen cases and notes the effect of the serum as follows: An increase of phagocytosis, a decreased number of diplococci, with lessening of their vitality and clearing of the fluid. In patients who died the last culture was negative in all but one. In those who recovered the last culture was negative in all but one, and in this one the growth was very slight.

Churchill (14) summarizes his recent report as follows:

"1. In all cases clinically suggesting meningitis, do a lumbar puncture as early as possible.

2. If the fluid thus obtained be turbid, immediately inject at least 30 c.c. of Flexner serum directly into the spinal canal without waiting to hear the bacteriologic report of the fluid.

3. Examine the spinal fluid bacteriologically. Smears are more important than cultures. If the diplococcus intracellularis be found, repeat the injections daily for the three or four days following; in severe cases give the second dose twelve hours after the first.

4. After the first series of doses, wait two or three days, and if necessary, repeat the series.

5. The serum is a specific and is of value in meningococcic meningitis only.

6. It is useless to give the serum subcutaneously."

The keynote of success with this serum is early administration of large amounts. Where inflammatory exudate is formed in inaccessible parts or an obstruction is caused at the base of the brain, preventing the serum from reaching the cerebral meninges and ventricles, intraventricular injection through the anterior fontanelle or through a trephined opening should be used. Another important suggestion; *e. g.*, if the serum is lighter in specific gravity than the cerebrospinal fluid, keep the patient in a sitting posture for some time after the injection is made. If it is

heavier than the cerebrospinal fluid invert the patient, thus diffusing the serum in the direction of greatest inflammatory activity.

TYPHOID.

In the serum treatment of typhoid, Chantemesse's (15) success in 1000 cases with a mortality of 4.3 per cent. is unparalleled. Of the patients given the serum before the seventh day all recovered. This serum, produced by inoculation of horses with typhoid toxin, acts indirectly on these poisons by stimulating opsonin production.

The report of the committee (Hektoen, Weaver and Tunncliffe) (16) investigating the serums and vaccines for streptococcus, staphylococcus and pneumococcus infections shows these serums to be inert when injected into rabbits, so far as the opsonic index proved. The serum for streptococcus seemed rather to reduce the natural resistance and to hasten death.

Parks (17) speaks favorably of Moser's antistreptococcus serum in scarlet fever, and I have personally employed Arenson's polyvalent anti-streptococcus serum with apparently good results. Scheidemandel (18) reports serious symptoms following the uses of antistreptococcus serum.

There are now seven different specific antivenins (19) produced. Todd (20) of the public health department of the Egyptian government, has succeeded, by immunizing horses with scorpion venom, in preparing a serum that is capable of neutralizing in 2 c.c. doses the poison of one scorpion and has both prophylactic and curative properties. Its use in Egypt last summer was successful as to mortality and reduction of pain.

In gonorrheal infections both the serums and vaccines have been used with apparent success. As to the value of treatment of gonorrheal infections by one or both of these agents, depending on the particular affection in a given case, "There can be no doubt," says Thomas (21). In the treatment of acute gonorrheal rheumatism, especially in those cases occurring early in a primary gonorrhea, the pain and swelling quickly subside and in many cases recovery takes place in a week or ten days. In chronic cases the serum is less prompt and there are frequent relapses. In those cases in which the urethra, prostate, and vesicles are infected and are not treated—only temporary benefit can be received from the serum. In epididymitis the serum is useful in both acute and the relapsing form, and should be continued. In the acute prostatitis and vesiculitis there is marked benefit by the prompt relief of pain and shortening of the attack.

Important reports upon the use of the gonococcus serum and vaccine have been made by Swinburn (22), McMasters (23), Berry (24), Plummer (25), and others. I would mention briefly the report by Coyne and Auché (26) of the successful use of antidyenteric polyvalent serum in the treatment of infantile dysentery. Lawen (27) speaks of the serum treatment of anthrax as giving very promising results at Trendelenburg's clinic. Trembur (28) reports the use of sheep serum in the treatment of hemophilia, noting one successful case.

Loeffler (29) reports the benefit of serum therapy as a prophylaxis and curative agent in foot and mouth disease. Loeb (30) reviews the empirical treatment of inoperable sarcoma by erysipelas and prodigious toxins: he mentions Coley's 430 cases, in which about 11 per cent. of the tumors disappeared, 6.5 per cent. of these, or 3 of the total number, remained without recurrence for over three years after cessation of treatment. There were three deaths probably as a result of the treatment. From 14 surgeons who had personal experience with this mode of treat-

ment Loeb obtained reports of 78 cases of sarcoma with four "cures." Injections of the toxins seemed to weaken the patients and sometimes it produced a sloughing. Robinson (31) reported the beneficial effect of the Coley serum in controlling pain. Johnstone (32) reported satisfactory results of the Coley serum in two cases.

BACTERIAL VACCINES.

The term vaccine is applied primarily to the virus from bovines used in vaccination against smallpox, which at this time has practically stamped out what was once a disease of childhood. The glycerinated vaccine has supplanted the old dry points, which usually contained a large number of bacteria. The new Federal regulations forbid interstate traffic in the old-style dry points. These regulations require that the animals be autopsied after removal of the virus, in order to determine the absence of disease. The virus from an animal showing indications of complicating infections must be destroyed. These and other measures make our vaccine virus of to-day safe and superior in every way to the old.

The use of the bacterial vaccines now proving of therapeutic value is based upon the opsonic theory, advanced by Sir A. E. Wright. From the mass of reports some brilliant results are found—some of doubtful value and some of positive harm. The whole subject has been sifting through an experimental stage, of which little was known or understood; however, with increased knowledge, more exact and scientific courses can be pursued. But we are yet far from realizing the dream of the immortal Pasteur, when he said "It is possible for man to eradicate every contagious disease from the face of the earth."

One of the common causes for failure with bacterial vaccines is misapplication; that is, the attempt at active immunization when the defenses have been exhausted and a bacteriemia exists. These are cases for anti-toxins and not for toxins. The whole subject is confused and confusing, on account of the variability in the application. Some guide their doses by the opsonic index, others on clinical signs; some are satisfied with stock preparations and others insist on autogenous bacterial vaccines. Doses, intervals, and the keenness of observation and excellence of judgment are likewise at variance.

B. A. Thomas (33) concludes his report of 119 infections treated by vaccines as follows:

"1. The diseases contraindicated for bacterin therapy are the diffuse infections characterized by septicemia, pyemia, and grave sapremia.

"2. Those in which therapy by this agent is beneficial or curative are the superficial acute, subacute, and chronic processes, especially the last two.

"3. The acute cases, in which brilliant results can be uniformly expected, are those of acne vulgaris, furunculosis, carbunculosis, and subcutaneous abscesses.

"4. Subacute and chronic gonorrheal and tuberculous affections are amenable to bacterial immunization, and because of the impossibility and impracticability often of employing an autogenous bacterin the reliable stock preparations should be used.

"5. Certain acute gonorrheal infections can be benefited.

"6. It is questionable whether tuberculin therapy should ever be employed in very acute tuberculosis. Opinion is divided as to whether or not acute miliary tuberculosis and death supervened as a result of tuberculin therapy in one of our cases.

"7. The mixed infections in chronic tuberculous disease afford an important prospective field for alternating bacterial inoculations and tuberculin therapy.

"8. Autogenous bacterin are always to be preferred over the stock preparations, and success or failure frequently depends on this fact.

"9. Although the duration of the period of greatest potency of bacterins is undetermined, the best results have been obtained when the pus has been recultured and a fresh bacterin prepared every two to four weeks.

"10. It is believed that the best effects, therapeutically, particularly in chronic cases, occur when the quantity of bacterin is slowly and cautiously increased during successive inoculations, thereby, as has been thoroughly demonstrated in tuberculin therapy, avoiding high hypersusceptibility or anaphylaxis.

"11. Therapy by both bacterins and tuberculins can be satisfactorily executed by keen observance of the clinical symptomatology. Reliance on the opsonic index as a guide is not only unnecessary, but often actually conducive to erroneous conclusions, owing to its variability.

"12. Bacterin therapy, by virtue of its potency to do more harm than good, when unskillfully managed, will or should probably not become a universal therapeutic measure in the hands of the general practitioner, unfamiliar with bacteriology or work in the laboratory. Ignorance and wantonness are incompatible with ambition and energy, and an otherwise meritorious therapeutic agent thus abused will ultimately fall into disrepute.

"13. Therapy by the employment of bacterins made from bacillus pyocyaneus has been entirely useless.

"14. Bacterins and tuberculins are not 'cure-alls,' but when intelligently used serve as invaluable aids to Nature in fortifying the bodily defenses, thereby accelerating convalescence, diminishing complications and promoting cure."

The tuberculin reaction in the eye, according to Peter (34) has a distinct though limited field. Bandelier and Roepke, in the third edition of their book on the specific diagnosis of tuberculosis, have few words of commendation for the conjunctival test. Wolff-Eisner (35) has made 4,000 tests and asserts that a positive ocular reaction to tuberculin, with his technique, indicates an active tuberculous focus, while the cutaneous methods give positive findings even with latent foci. McNeil (36) uses both skin and eye reaction, but rather favoring the former. The eye test is evidently more dangerous and is contraindicated in the presence of eye affections and, if positive, speaks only for active processes that can be diagnosed by other methods. If negative, it is of no value, for it is not nearly so sensitive as the cutaneous test. The skin test is now regarded as a most valuable addition to the means of diagnosing tuberculosis.

Lowenstein (37) reports favorably his experience with tuberculin treatment of 300 cases of open pulmonary tuberculosis. The main point he makes is to avoid introducing new toxins before the effect of the previous toxins has been thrown off.

P. K. Pel (38) says that he has been unable to acquire much enthusiasm for tuberculin therapy, and he declares that the failure to institute the treatment is not a sin of omission for the present.

Burroughs (39) says, "in my opinion tuberculin is of no value except for diagnostic purposes."

Bullock (40) says, "I have employed tuberculin extensively but can not find its place, if it has any, in the treatment of tuberculosis."

Trudeau says, "I have no statistics to present beyond what the post-discharge mortality of patients at the sanitarium has shown; namely, that from 18 to 25 per cent. more of the treated than the untreated cases discharged from the sanitarium during the past 15 years were living at the time we made inquiry."

Pottenger (41) speaks favorably of the tuberculin treatment. "In the hands of careful men," he says, "the opsonic index will yield results."

McFarland (42) is opposed to the treatment and bases his opposition on the fact that "no animal can be immunized against tuberculosis by any previous treatment with tuberculin, nor can any animal already tuberculous have its life considerably lengthened by tuberculin."

Theodore Potter (43) says, "after 15 years in the use of tuberculin to some moderate extent all the way along and more actively lately, I confess I do not know whether it is of much use or not."

Autogenous vaccines have been extensively employed with some exceptionally gratifying results. Favorable results have been reported with the vaccine treatment in infections with streptococcus erysipelatos (44) and streptococcus rheumaticus and pyogenes aureus (45). Wilcox, Morgan, and Leary (46) report favorably on the use of vaccine in pneumonia.

Dr. Frank Oastler (47), speaking of pelvic infections, expresses the belief that the greatest good accomplished by bacterial vaccines up to this time is in the treatment of subacute or chronic pyemia or septicemia; that the acute violent cases of puerperal sepsis do not respond to the bacterial vaccines. Vaccines are indicated after the acute attack where there is poor resistance, often in these turning the tide in favor of the patient; the dose is still experimental. Oastler claims most satisfactory results with the staphylococcus aureus and bacillus coli and less with the streptococcus. Gonococcus vaccine in gonorrheal urethritis is disappointing. Reviewing their treatment of 97 cases of sepsis with bacterial vaccines, Hartwell, Streeter, and Greene (48) draw the following conclusions: First, that bacterial vaccine should be further employed in puerperal infections that do not immediately respond to routine treatment; second, that bacterial vaccines are of much value in the type of sepsis which has remained stationary for some time.

The experience of the Germans with antityphoid inoculation confirms the results reported in England and the British army. As a result of these apparent successes it is proposed to introduce the same procedure into the army of the United States.

OBITER DICTA FROM FOREIGN JOURNALS.

ROUSSEAU'S MENTAL STATE.

Among the important books recently published in Paris none compares in interest with "*La Mort de Jean-Jacques Rousseau*," by Dr. Fabien Girardet. Every admirer of the Genevese philosopher's books should make a point of reading this admirable biography, for the instruction he will receive will be of enough importance to rank among those excellent impressions which are derived only from exceptional works. Moreover, since Rousseau is to-day the commanding figure in the world of thought, any new light on his life should be greatly welcomed and that Dr. Girardet has not failed in this is attested by many pages of his book. Unlike most medical biographers the author does not by preference wallow in filth; and though he grills the subject of his biography in no unmistakable way before the open fires of medical science, his methods never smack of brutality. The following excerpt, though brief, is a fair illustration of the author's critical judgment:

It would not be wrong to admit at once that, on account of dwelling on certain obscurities in the mentality of Rousseau, an opinion obtains among the critics that can be only characterized by the distinctive term—false. Just as Rousseau was justified in saying, despite his numerous diseases, that he had a constitution of iron, the fair-minded critic should put a like estimate on his mentality. Although it cannot be denied that there were decided lacunæ in his intelligence, defects which on certain days were sombre enough to obscure his usual intellectual radiance, there was no end of instances in his career when the intellectual wick, so to speak, instead of becoming completely extinguished, revived again; and then there issued from his sublime genius vibrant thoughts, exquisite dreams, innumerable projects, and writings which were both wise and unusual. Alternately, lassitude and audacity, indolence and activity, cowardice and courage, succeeded each other in a manner most contradictory and paradoxical. Now what was the cause of this? Was Rousseau's mind defective? I hardly think so. If Rousseau passed through mental stages which bordered on dementia, if he had decidedly marked moral and mental perversions, all these did not make for insanity; in fact, it can be said he was not even a neurastheniac, but a psychasthenic, a neurotic. A neurotic he was, without a doubt, just as is every one who fatigues his mind by the strenuousness of an intellectual life that disturbs to its profoundest depths a susceptibility, which is so sickly that it responds to the slightest sensation or sentiment, similar to the vibrations of a tense violin string when the bow is handled by an artist who plays with all his soul. Thus was Rousseau.

As far as it is possible to judge so difficult a mind as Rousseau's, let us attempt to analyze it by examining his intelligence, his mental faculties, his aptitudes; let us make researches into the mode of his cerebral activity and its defects; let us study his susceptibility, his character; and

when we shall have dissected his "I," we shall find in medicine the diagnostic conclusion which will enlighten us as to their causes.

It seems at first to be far from right to subject so vast a mind as was Rousseau's to the restrictions which necessarily accompany medical observation. Nevertheless, it is my opinion that this is the only way to arrive at correct conclusions. Just as anatomical dissection is of interest to the physician, so is mental dissection a matter of importance to the medical expert; and, especially, in the case of Rousseau will the latter find food for thought, since it is my intention to make a diagnosis of Rousseau's mentality that shall justify the presumptions which have been raised in regard to his suicide. Moreover, this dissection of Rousseau's mind will be found of great interest from the point of view of psychology, since men of genius of the Rousseau stamp know best to reveal in the most striking fashion their innermost ideas, their smallest aptitudes, and the growth of their intelligence. Auguste Comte has wisely said of men of genius, "These are the grand types of humanity." Therefore, in studying them one cannot fail to understand just what the human mind is in its most sublime condition. If the contention is raised that all men of genius are really anomalies, I would reply that the normal man does not exist; hence, we are justified in turning to those gifted men of extraordinary mental attainments if we would garner the edifying lesson as to the personality, the "I" of mankind.

The intellectual qualities of Rousseau are clearly understood when one takes into consideration his acquired knowledge, his cerebration, the tendency of his writings, and his candid judgment of himself as evidenced in his "Confessions."

The knowledge which young Rousseau acquired was as checkered as his general education. Even when a mere child his father encouraged him to read in the most indiscriminate manner, and the result was that his imagination developed to such an extent that he had the most romantic and false ideas of society. Again, his association with his pastor, Lam-bercier, yielded him but a slight knowledge of Latin, and his sojourn with the catechumens at Turin granted him but the bare outlines of religious principles. On the other hand, the lessons of the Abbé de Gouvon were much more profitable. "Not only," says Rousseau, when speaking on this subject, "did I learn Italian in all its purity, but I acquired a taste for Italian literature and some knowledge of good books; facts which were of great value to me when I studied alone."

It appears that the best stage of his intellectual development was achieved when he became associated with Mme. de Warens. He informs us that at that time he read a great deal and succeeded in obliterating the defects of his early education; in fact, his eagerness to learn and his industry were thoroughly out of keeping with his former indolence. "I felt," writes Rousseau in his "Confessions," "that what I was doing in the matter of work was good and useful and would lead to the changing of my methods of study. Taking up the study of the encyclopedia, I first divided it into various chapters and then studied each one separately up to the point where it merged into another chapter. Thus I formed a complete synthesis of what I read."

Rousseau devoted himself not only to the study of literature but also to the study of philosophy, reading "The Logic (Jansenism) of Port-Royal," Locke's "Essay Concerning Humane Understanding," Malebranche, Descartes, etc. "In reading each author," says Rousseau, "I made it a law of adopting and following all his ideas without mixing them with my own or those of another writer; and I never disputed the correctness

of these ideas. At the end of some years passed in thinking the thoughts of another, without any reflection on my part, almost without any exercise of my reasoning faculties, I had acquired the educational groundwork which allowed me to think without the help of any other writer. Then, when my travels and my business affairs deprived me of the means of consulting books, I passed the time by recalling what I had read, weighed each thought in the scales of reason and passed judgment on my masters. Though I began late in life to exercise my judicial faculty, I cannot say that it suffered thereby; for when I published my own books the criticism they met with was never accusatory of my being a servile disciple of another."

The fact is that before long Rousseau revealed himself in a fashion as unexpected as it was extraordinary; witness thereof being his "Discourse on the Sciences and the Arts," his "Discourse on the Origin of Inequality Among Men," "The New Héloïse," "The Social Contract" and "Emile." At once it was seen that his learning had been purely personal and that the method which he had adopted as well as his natural gifts had made of him the genius that the world recognizes to-day. He belonged to no school of writers for he always wrote in an independent way; he was always himself; he never changed; and, in truth, he is the offspring of his own works.

CORRESPONDENCE.

PARIS LETTER.

THE PRESENT STATUS OF ANTIMENINGOCOCCIC SERUM THERAPY.

By AUGUSTE A. HOUSQUAINS, M. D.

The work done on this subject is all of recent date, but it has been subjected to simultaneous research at the hands of a great number of investigators. Furthermore, a recrudescence of epidemics of cerebrospinal meningitis, a more thorough knowledge of the symptoms of this affection, the extended use of Quincke's lumbar puncture, the conception of the cytologic reactions presented by the cerebrospinal fluid in cerebrospinal meningitis—a conception due to the works of Vidal, Sicard and Ravaut—have put in the forefront this affection of which Weichselbaum in 1887 discovered the specific germ. It is of special interest to practical medicine that these investigators have not limited themselves solely to pure pathogenesis or of semeiology, but have found an immediate application in the treatment of cerebrospinal meningitis.

The antimeningococcic serum as at present prepared has found applications numerous and decisive enough for the universal admission of its great value. Points for discussion still remain, it is true, and recently published facts necessitate the verdict of time. It can be affirmed, however, that a disease hitherto most formidable, and even yet decidedly grave, finds us no longer entirely disarmed, now that we know how to recognize it with precision and to combat it in under known conditions.

S. Flexner and Jobling, in the United States, Kolle and Wassermann, Jochmann, Ruppel, in Germany, Dopter, in France, have made known the possible applications of antimeningococcic serum in human therapy. These authors, moreover, have had recourse for the extremely delicate process of preparing this serum to different techniques.

Flexner first immunized horses by means of dead cultures, then by living cultures, then by toxins, which he introduced at first subcutaneously and subsequently intravenously. Later on, in consequence of the numerous accidents among the horses under observation, he had to modify his technique and no longer had recourse to the subcutaneous injections.

Kolle and Wassermann proceed as follows: they immunize three horses. The first receives at first subcutaneously and later intravenously, dead cultures, then living cultures of an accurately identified meningococcus; the second receives, under the same conditions, cultures of many strains of meningococcus; while a third horse is inoculated first subcutaneously then intravenously with an extract from a single kind of

meningococcus. The mixture, in equal parts, of the serum of these three horses forms these authors' antimeningococcic serum for use in human therapy.

Dopter, in the works from which I shall quote freely in the course of this letter, began at the end of 1907, upon the advice of M. Roux, to inoculate horses against the meningococcus at the Pasteur Institute. At present he inoculates these horses only with living cultures alone, which are introduced at first into the subcutaneous cellular tissue, afterwards into the veins. The immunization of a horse ordinarily requires from three to four months, to render its serum really active against cerebrospinal meningitis.

All these serums possess agglutinating, sensitizing, opsonizing, and precipitating properties; they are, in short, endowed with an indisputable curative power in cerebrospinal meningitis. Many published records bear witness to their therapeutic value, not only in this disease, but also in the extrameningeal manifestations of meningococcus disease. Their action, on the other hand, is negative in meningitides of all other kinds, such as the tuberculous, pneumococcic and streptococcic forms. Various proofs can be given of the efficacy of the antimeningococcic serums. There is, first, the diminution of mortality. When it rages in epidemic form the statistics show that the mortality is from 60 to 70 per cent.; but during the French epidemic of 1909, in which 339 cases were recorded, the mortality was 16.20 per hundred. But if one deducts the fulminating cases and those injected *in extremis*, it was only 11.80.

Another effect of the serum is the notable and rapid attenuation of the morbid symptoms and the progressive resumption of its normal character by the cerebrospinal fluid, which becomes clear again and the microscope shows that the polynuclears lose their pus-like appearance. The serum reduces the duration of the affection. If we except certain rebellious cases, the disease ordinarily continues no longer than from 8 to 12 days. Convalescence is more rapid, less painful, and the patient does not present that lifeless aspect, that dull, indifferent, fixed look, those motionless features, that constitute the special characteristic "mask" of meningitis treated by the old-time methods. This rapidity of evolution brings also another consequence, the rarity of sequelæ; serum therapy does not usually leave them time to develop, in fact, sequelæ appear in only 6.20 per cent. of cases treated with the serum of the Pasteur Institute, as against a former record of 60 per cent. of sequelæ which often included such grave infirmities as blindness, deafness, and various forms of paralysis.

To employ antimeningococcic serum therapy with a maximum of useful result, it must be used according to certain established rules confirmed by experience. In the first place, subcutaneous injections are absolutely inefficacious and consequently their use should resolutely be abandoned. This fact is to be explained by the relative impermeability of the meninges from without inwards. W. Schultz, Toebben, Huber, C. H. Mueller, Currie, and other observers, have abundantly established this fact by their statistics. In point of fact the death rate of cases treated in this fashion is identical with that of cases treated by the ordinary methods.

The injections, then, must be made into the arachnoid cavity, in order that the serum may be brought into direct contact with the meningeal lesions, and after a preliminary lumbar puncture performed by preference in the lateral decubitus; a quantity of the cerebrospinal fluid, equal in amount to the serum to be injected, is removed. It is preferable to withdraw an amount of fluid even greater than that of the serum to be injected for by this means a more considerable decompression is brought

about, a greater quantity of toxic substances is removed from the spinal canal, and, finally, the serum is less diluted on its introduction.

Immediately after the puncture and without withdrawing the needle, the injection is made by means of sterilized syringe, previously filled with serum, warmed to 38° C. The nozzle of the syringe is fitted into the cup of the needle *in situ* and the fluid is injected slowly, progressively, and steadily; the needle is then rapidly withdrawn, the spot antiseptically washed, and the puncture covered with a fragment of cotton soaked in collodion. On completion of the operation the patient is immediately placed in such a position that the serum can diffuse itself towards the upper nervous centres. The pelvis is elevated above the level of the head, the bolster and pillow are removed, and one or more cushions are placed under the pelvis. The patient should remain in this position from 5 to 6 hours. If there be agitation or delirium, a morphine injection will quiet the patient and produce a state of restfulness.

The technique of the injection therefore is simple. A more important matter is the dose to be injected as well as the repetition thereof.

It is absolutely necessary to inject large doses; in an adult a dose of 10 c.c. is altogether insignificant; at least 20 c.c. must be injected, and in most cases, especially the grave ones, there must be no hesitation in injecting 30, 40 or even 45 c.c. of serum. In a child, even less than one year of age, it is easy to inject 10, 15, 20 or even 30 c.c. It is evident that the more severe the attack, the greater should be the amount of serum introduced.

Most frequently these doses may be repeated during several days, unless the case is light. It is indeed rare that a single injection, even of a large dose, can radically check the meningitis; even when after an injection everything seems going well, it often happens that in 24 or 48 hours the meningeal phenomena reappear, and call for fresh injections. Certain subjects also require the serum to be given in several doses for the attainment of a definite cure. These facts are adequately explained by the observations of Netter and Debré, who have demonstrated the rapid passage of serum into the general circulation. In consequence of this rapid absorption, the serum remains in contact with the meninges for only a very short time, a time too short to check off-hand the often extensive alterations occurring in cerebrospinal meningitis.

These doses may be systematically repeated during three or four consecutive days (Duenn, Lévy, Churchill, Netter). Certain authors, on the other hand, prefer to repeat the injection only in case the first injection fails to bring about any noticeable improvement (Kolle and Wassermann, Koplik, Emmet Holt, Comby).

As regards the occasion for a new injection, the tendency is to base it upon the thermal curve. That is a very untrustworthy guide; it is preferable to base it on the *ensemble* of symptoms, or better still on the macroscopic or microscopic aspect of the cerebrospinal fluid. That alone reflects the state of the meningeal alterations. Its study permits us to follow step by step their progress or retrogression. It is in this study, then, that we must seek the necessary indications for sero-therapeutic intervention.

The antimeningococcic serum, in short, rationally used, constitutes, as Dopfer expresses it, a powerful therapeutic agent and one endowed with the character of high specificity. But, we repeat, it is essential to establish an exact diagnosis of the meningococcic nature of the meningeal process in point; and it is not sufficient merely to inject serum; it must be injected in sufficient quantity and in sufficiently repeated doses.

DIAGNOSTIC AND THERAPEUTIC NOTES.

THE SIGNIFICANCE OF INDICANURIA FOR THE DIAGNOSIS OF PANCREATIC DISEASE.—Zuccola (*Gazz. d. Osped.*, 1909, No. 130; *Muench. med. Wochenschr.*, 1910, No. 16). Recent work on the surgery of pancreatic disease has so increased our ability to cope with disorders of this organ that any simple method that can aid us in diagnosing these affections is doubly welcome. Zuccola has found that in serious disturbance of pancreatic function, especially when accompanied by obstruction of the pancreatic duct, the urine is always free from indican. The explanation of this phenomenon lies in the fact, established by Gerhardt and others, that indol is formed in the intestine as an end-product of tryptic digestion of proteids. When no trypsin is excreted, indol cannot be formed and indican does not appear in the urine. The test is all the more striking because the various affections that must be differentiated from pancreatic disease are usually accompanied by an increased indicanuria.

AUTOSEROTHERAPY OF PLEURITIC EFFUSIONS.—Boinet and Murel (*J'l. de méd. et de chir.*, 1910, No. 8). In 1894 at the Medical Congress in Rome, Gilbert of Geneva, communicated a new method of treating pleuritic effusions. This, which he called autoserotherapy, consists in injecting hypodermically a few cubic centimeters of the patient's own serous pleuritic fluid, obtained by means of aspiration. His example has been followed chiefly in Italy and France, where in general favorable results were obtained. An important communication on this subject was made last year by Marcou of St. Petersburg. He reports 82 cases of serofibrinous exudative pleurisy so treated, almost always with favorable results, the pleuritic fluid being promptly and permanently absorbed. In no case were there any ill after-effects. Over half of his cases had remained under observation for from one to three years after the injection of pleuritic fluid. In no case was he able to note an unfavorable influence from the injection upon the tuberculous process. Boinet and Murel used the technique advised by Marcou. It is simple and nearly painless. After sterilization of the skin a long needle attached to a hypodermic syringe is thrust through the chest wall into the pleuritic fluid. One or two cubic centimeters of the fluid are aspirated; the needle is partly withdrawn, thrust laterally into the subcutaneous tissue and the contents of the syringe injected hypodermically. It is unnecessary to evacuate the pleuritic fluid.

In five of their six cases, an abundant diuresis set in promptly and led to a rapid, complete and permanent absorption of the fluid. At the same time the dyspnea, when present, disappeared. They never observed any reaction, either local or general.

The rationale of this phenomenon is not quite clear. Similar results have been obtained by means of tuberculin injections, and it may be that the pleuritic fluid, which contains a little tuberculin (at least in tuberculous cases which make up the bulk of the serofibrinous pleurisies), acts like the artificial tuberculin. This does not, however, explain the astonish-

ing effect of a single injection, since in the tuberculin treatment a course of injections is required.

It has also been objected that pleuritic effusions are often spontaneously absorbed and still more frequently vanish after the aspiration of a relatively small amount of fluid. The withdrawal of a single cubic centimeter of fluid could hardly, however, be expected to produce any such result. Moreover, four of Boinet and Murel's cases had previously been subjected to one or more thoracenteses with prompt re-accumulation of the fluid. These cases like the others yielded promptly and permanently to the procedure of autoserotherapy. In view of its simplicity and safety, the method clearly deserves a trial in suitable cases.

SCIATICA AND FLAT-FOOT.—Klug (*Deutsch. med. Wochenschr.*, 1910, No. 14). In connection with an interesting account of the treatment of sciatica by means of a steam-douche, Klug calls attention to a common diagnostic error that is by no means generally appreciated. A symptom-complex that cannot clinically be distinguished from true sciatica may be brought about by a sinking of the arch of the foot. In every case of sciatica the foot on the affected side should therefore be carefully inspected, both in the sitting and lying posture. If there is any abnormality of the arch, proper treatment, by means of supports within the shoe, should at once be inaugurated. Often sciaticas that have resisted all treatment will then promptly be ameliorated or entirely disappear. Of his last 40 cases of sciatica, 15 per cent. were successfully treated by means of such supports to the arch.

THE USE OF OIL IN ABDOMINAL SURGERY.—Wilkie (*Surg. Gynec. and Obstet.*, 1910, No. 2). As the result of considerable animal experimentation as well as some clinical experience, Wilkie advises the introduction of several ounces of sterile oil into the abdominal cavity, for the purpose of preventing the formation of peritoneal adhesions. It may be used, after operations for the relief of old adhesions, to prevent their forming again, to prevent the formation of adhesions in operations involving much handling of the viscera, and in operations for generalized peritonitis to favor subsequent drainage and intestinal peristalsis.

The method promises to be valuable, especially in the first group of indications. Hitherto, surgeons have hesitated to operate for the relief of old peritoneal adhesions because it seemed certain that they would re-form promptly. A procedure that will prevent this is sure of a welcome.

Wilkie uses sterile vaseline oil. A private communication to us from a pathologist who is investigating the value of various oils for the purpose of preventing such adhesions is to the effect that still better results are to be expected from the use of sterile cotton seed oil.

A SIMPLE STAIN FOR DIPHThERIA BACILLI.—Sommerfeld (*Deutsch. med. Wochenschr.*, 1910, No. 11). Sommerfeld's stain is an extremely simple one. The spreads, whether taken from a culture or directly from the throat, are dried and fixed in the flame in the usual manner. They are then stained with any of the usual methylene-blue solutions, decolorized for a few seconds with formalin (40 per cent. formaldehyde), or better equal parts of formalin and alcohol, dried and examined. The

polar bodies stain deep blue, the rest of the bacillus pale blue. Our own experience with this method indicates that it is not without value. The pictures obtained are not as beautiful as with some of the more complicated methods, but are quite sufficient for diagnostic purposes. The methylene-blue solution and the formalin-alcohol mixture are kept in wide-mouthed bottles. The culture or throat-swab to be examined is spread over the lower third of a glass slide, dried and fixed in the flame, dipped first for ten seconds (or longer) into the methylene-blue solution, then for one or two seconds into the formalin-alcohol mixture, dried between filter paper and examined. The entire procedure requires less than thirty seconds and is especially useful where a considerable series of examinations must be made.

THE SIGNIFICANCE OF ABDOMINAL BREATHING IN HEART DISEASE.—Rumpf (*Deutsch. med. Wochenschr.*, 1910, No. 14). Although the physical methods of treating cardiac weakness are at present coming into their own, one important method of personal hygiene, a proper method of breathing, has according to Prof. Rumpf been hitherto unduly neglected. With each inspiratory act in thoracic respiration, the pressure in the upper portion of the mediastinum, containing the auricles and the great venous sinuses, is lessened as compared with the lower portion containing the ventricles. If the heart is already weakened, with dilated auricles and engorged great veins, this diminution of the pressure in the upper mediastinum throws an additional obstacle in the way of the flow of the blood from the great veins and the auricles into the ventricles. In diaphragmatic breathing the reverse is true. The downward pull of the diaphragm enlarges chiefly the lower portion of the mediastinum and tends to suck, as it were, the blood from the veins and the auricles down into the ventricles. Moreover, each contraction of the diaphragm tends to squeeze the blood out of the engorged liver and out of the abdominal veins and, to this extent, aids the work of the heart. Accordingly, and this is confirmed by clinical evidence, abdominal breathing is distinctly more advantageous for sufferers from heart disease than the thoracic type. Patients, especially women, who have grown accustomed to the costal type of respiration, do not readily learn to breathe with their diaphragms. Careful training in respiratory gymnastics is required.

UNEQUAL PUPILS AS AN EARLY SIGN IN PHTHISIS.—Geza Fodor (*Wien. med. Wochenschr.*, 1910, No. 11). In pulmonary tuberculosis, the pupil on the side of the affected lung is said to widen more in feeble light than the pupil on the other side and to respond to light less completely and more sluggishly. In the majority of his cases the writer found this phenomenon present, often at a stage of the disease where no definite pulmonary lesion could be made out. He ascribes it to irritation of the sympathetic plexuses.

BOOK REVIEWS.

DISEASES OF THE NOSE, THROAT AND EAR. By Charles Huntoon Knight, A. M., M. D. Professor of Laryngology, Cornell University Medical College; Surgeon, Manhattan Eye, Ear and Throat Hospital; Consulting Laryngologist, New York State Hospital for Crippled and Deformed Children, etc., and W. Sohler Bryant, A. M., M. D. Consulting Otologist, Manhattan State Hospital; Senior Assistant Surgeon, Aural Department, New York Eye and Ear Infirmary, etc. Second Edition, Revised with 239 Illustrations. Philadelphia: P. Blakiston's Son and Co. 1909.

As stated by Dr. Knight in his preface this is a revision of his former work on "Diseases of the Nose and Throat" with an additional section on "Diseases of the Ear" by Dr. Bryant. Approximately 400 pages are devoted to the former, 200 to the latter.

From an historical point of view Dr. Knight's contribution contains much that is interesting. It would seem, however, that entirely too much space has been devoted to discussing and illustrating methods and operations now obsolete and forgotten by many; too little space given to the more recent advances concerning which the student, as well as the practitioner, wishes to be informed. As examples of the latter might be mentioned the very brief descriptions of the operations for tonsillectomy and submucous resection of the nasal septum. The discussion of the various topics is in many instances decidedly rambling. We doubt if the student would have any very definite and fixed ideas after their perusal.

The section on the ear by Dr. Bryant contains an excellent chapter on the Anatomy, Development, Comparative Anatomy and Embryology of the ear. The remaining chapters have little to commend them. The discussion of important topics is in most instances dogmatic, brief and hardly an expression of the most modern ideas. Practically no reference is made to the modern surgery of the labyrinth, while any reference to nystagmus as an invaluable diagnostic sign in diseases of the inner ear and cerebellum is conspicuous by its absence.

Considering the general lack of definite knowledge concerning the functions of the utricle, saccule and otoliths it would seem that the author was somewhat too positive in his statements regarding them. The function of the semi-circular canals, which rests upon a fairly firm basis both clinical and experimental, receives but passing notice.

The book contains much that is valuable. The illustrations are especially good, notably those dealing with the anatomy. On the whole, however, it can hardly be said that the work is up to the standard of some of the other recent textbooks on the subject.

EMERGENCIES OF GENERAL PRACTICE. By Percy Sargent, M. B., B. C. (Cantab.), F. R. C. S., Surgeon to Out-Patients, St. Thomas's Hospital, Surgeon to the National Hospital for the Paralysed and Epileptic, Queen Square; and Alfred E. Russell, M. D., B. S. (Lond.), F. R. C. P., Physician to Out-Patients, St. Thomas's Hospital. London and New York: Henry Frowde, Oxford University Press. 1910. Price, \$5.50.

Of the two authors of this book, the former is a surgeon, the latter an internist. Together they have succeeded in discussing with a surprising degree of completeness the diagnosis and treatment of the entire range of surgical and medical emergencies, in brief compass. The necessity for compression has resulted in a rather dogmatic tone, but, with hardly an exception, their directions embody the best modern practice. From the nature of the subject, refinements in diagnosis have had to be neglected and the discussion of the after-treatment following the relief of the emergency is of the briefest.

The bulk of the book is naturally devoted to surgical emergencies, but acute respiratory, circulatory, and abdominal affections have each their chapter, as well as the acute infective diseases and nervous affections. The wealth of material compressed between the two covers forbids any detailed discussion, but special attention may be called to the excellent chapter on anesthetics in procedures of urgency. The book will be found useful for hurried reference as well as interesting on leisurely perusal.

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INTERSTATE MEDICAL JOURNAL

BOOKS RECEIVED.

- PROGRESSIVE MEDICINE**, a Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences, edited by Hobart Amory Hare, M. D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia; Physician to the Jefferson Medical College Hospital; One Time Clinical Professor of Diseases of Children in the University of Pennsylvania; Member of the Association of American Physicians, etc., Assisted by Leighton F. Appleman, M. D., Instructor in Therapeutics, Jefferson Medical College, Philadelphia; Ophthalmologist to the Frederick Douglass Memorial Hospital; Instructor in Ophthalmology, Philadelphia Polyclinic Hospital and College for Graduates in Medicine. Containing the following articles: Hernia, by William B. Coley; Surgery of the Abdomen, by Edward Milton Foote; Gynecology, by John G. Clark; Diseases of the Blood. Diathetic and Metabolic Diseases, etc., by Alfred Stengel, and Ophthalmology, by Edward Jackson. Volume II. June, 1910. Philadelphia and New York: Lea and Febiger. 1910.
- HAND-BOOK OF ELECTRO-THERAPEUTICS**, by William James Dugan, M. D., Lecturer on Electro-Therapeutics at Jefferson Medical College, Philadelphia; Physician-in-Charge of the Electro-Therapeutic Department and Assistant in the Out-Patient Neurological Department of Jefferson Hospital; Fellow of the American Electro-Therapeutic Association. With ninety-one illustrations. Philadelphia: F. A. Davis Company. 1910. Price, \$2.00.
- A SYSTEM OF SYPHILIS**—in Six Volumes. Edited by D'Arcy Power, M. B. Oxon., F. R. C. S. and J. Keogh Murphy, M. C. Cantab., F. R. C. S. With an Introduction by Sir Jonathan Hutchinson, F. R. S. Vol. IV., Syphilis of the Nervous System. By F. W. Mott, M. D., F. R. S., F. R. C. P. London: Henry Frowde, Oxford University Press, Hodder & Stoughton, Warwick Square, E. C. 1910. Price, \$13.50.
- MEDICAL VADEMECUM IN GERMAN AND ENGLISH**. By B. Lewis. With Preface by Prof. Dr. A. Politzer. Philadelphia: P. Blakiston's Son & Co. Price, \$5.00.
- HAND-BOOK OF PHYSIOLOGY**. By W. D. Halliburton, M. D., LL.D., F. R. C. P., F. R. S. Professor of Physiology, King's College, London. Ninth Edition (Being the Twenty-Second Edition of Kirkes' Physiology), With Nearly Six Hundred Illustrations in the Text, Many of Which are Colored, and Three Colored Plates. Philadelphia: P. Blackiston's Son & Co. 1910. Price, \$3.00.
- OPERATIVE SURGERY FOR STUDENTS AND PRACTITIONERS**. By John J. McGrath, M. D., Professor of Operative Surgery at the New York Post-Graduate Medical School; Consulting Surgeon to the New York Foundling Hospital; Visiting Surgeon to the Harlem and Columbus Hospitals, etc. Third Revised Edition. With 276 illustrations, including many full-page plates in color and half-tone. Philadelphia: F. A. Davis Company. 1909. Price, \$5.00.
- DISEASES OF INFANCY AND CHILDHOOD, THEIR DIETETIC, HYGIENIC, AND MEDICAL TREATMENT**. A Text-Book designed for practitioners and students in medicine. By Louis Fischer, M. D., Attending Physician to the Willard Parker and Riverside Hospital of New York City, Attending Pediatricist to the Sydenham Hospital. Third Edition. With three hundred and three illustrations, several in colors, and twenty-nine full-page half-tone and color plates. Philadelphia: F. A. Davis Company. 1910. Price, \$6.50.
- HYGIENE AND MORALITY**, a Manual for Nurses and Others. Giving an Outline of the Medical, Social and Legal Aspects of the Venereal Diseases, by Lavinia L. Dock, R. N., Graduate of Bellevue Hospital Training School, Resident Member of the Nurses' Settlement, New York, Secretary of the International Council of Nurses. New York and London: G. P. Putnam's Sons. 1910.
- EDUCATION IN SEXUAL PHYSIOLOGY AND HYGIENE—A Physician's Message**. By Philip Zenner, Professor of Neurology in the Medical Department of the University of Cincinnati. 16mo. Pages 128. Cincinnati: The Robert Clarke Company. Price, \$1.00.

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EDITORIAL.

A NEW RUBRIC—NO. 606.

When a fillip is dealt to the stagnation which encumbers the medical mind in the summer months it needs must be an extraordinary one; otherwise the state of apathy will not be completely shaken off, since the unwritten law reads that the medical mind, simliar to all others, is entitled to a period of rest that shall have no greater ruffling than might emanate from the usual emptinesses of a midsummer conversation. But though we are no disrespecters of this unwritten law and are ever mindful of what the medical mind needs at this time of the year so as to prepare itself for its arduous tasks in winter, we feel that we would be remiss in our editorial duties were we to pass over in silence a discovery, which has recently been announced to the world and which is surely of enough import to arouse all medical men out of their condition of unconcern; especially, be it said, those self-centered individuals who latterly have taken such a fearsome interest in the control and even in the suppression of prostitution. We are now speaking of Professor Paul Ehrlich's anti-syphilitic discovery, which has goaded the European medical and lay worlds into an activity of thought that makes us hopeful, that before long, there will be no further use for the inanities of all those social and moral prophylaxis societies which have been the bane of our existence in the last twelvemonth.

But our mental distress caused by the theorists, whose sputterings are continually dinned into our ears, is really of secondary importance when considering Ehrlich's epoch-making discovery, the prime interest lying in the fact that at last we have an antisiphilitic preparation that is not the outcome of some vagary on the part of an eccentric therapist, but a careful and painstaking evolvment covering many years of close observation. As Professor Neisser says in an article in the *Neue Freie Presse*

of July 3rd, "Ehrlich's discovery is not—and this is important from a scientific standpoint—an accidental 'find', but the result of many years of uninterrupted study which step by step brought him nearer the goal that even in his student days engaged his thought, namely, to ascertain what specific antidotes would be effective in combating the parasites in the human body. What perseverance, what diligence must have preceded the discovery that arseno-benzol was the preparation against syphilis!" These weighty words of Neisser were surely not written in a moment of abnormal exaltation; hence the thought on our part cannot be other than in the preparation known as No. 606 the medical world is in possession of a product that has all the indisputable hall-marks necessary to a scientific undertaking.

The superficial reader of current events in the medical world may well ask to what practical purposes has this new preparation been put, and if any experiments have been made are they not still so thoroughly immersed in the atmosphere of the laboratory that their high purpose, as a combative agent against the severest symptoms of syphilis, is extremely doubtful? Is not this discovery, he might continue, of the same complexion as was Koch's tuberculin remedy, the announcement of which some twenty years ago attracted thousands of consumptives to Berlin, only to have their hopes laid prostrate by what proved at best to be a decidedly uncertain form of treatment? In reply to these questionings which are besetting the doubting Thomas we have in mind, we would say that though the discovery is Ehrlich's, the experiments which are now making are beyond his laboratory; and in the hands of so thorough a scientist as Professor Wechselmann of the Rudolf Virchow Hospital in Berlin, they have already been tried by the severest tests and have not been found wanting. What greater benefit has any remedy bestowed on mankind than was evidenced when Wechselmann injected 0.3 grammes of the Ehrlich preparation into an infant of six days, who had absolutely no chance of living on account of hereditary syphilis, and found that twenty-four hours afterwards there was no Wassermann reaction and that the child continued to live? Here, indeed, was something to give one pause, something that was unusual enough to make for the sort of enthusiasm that has the true ring! If one injection could abolish the worst symptoms with such alacrity in a mere infant, what effect would it have on those cases in the tertiary stage, which stubbornly oppose all the benefits supposed to accrue from an unintermitted drenching of the system with mercury and iodine? Wechselmann showed no hesitancy in continuing his experiments. A case which had for its insignia tertiary ulceration of the palate and nose required but one injection of the new remedy to bring about a rapid cicatrization. And thus the tale runs—hundreds, if not thousands

of cases, have been treated now by means of one injection and the clinical page reads like the page we are wont to see in those wonder-books which were never meant to be read by any one else but the youth with the immature mind.

Being social philosophers, as well as physicians, the reading of the reports which have been published in the leading European medical and lay journals has moved us to the contemplation of some of the social results which surely will follow at no great distance in the footsteps of Ehrlich's discovery. If syphilis can be nipped in the bud, so to speak; in other words, can be stopped before the tell-tale stigmata are so apparent that he who runs may not only read but tell all the neighbors, the disease will be robbed of its present exalted position as a text for many a sermon with which the religiously-inclined doctor has flayed the masses. But more than this, the matter of prostitution will no longer loom up before the medical world as a special province wherein the vaporings of doctors, who imagine that a youthful ardor is all that is necessary in the matter of solving the most intricate problems, will be encouraged. For with a remedy extant to combat syphilis at its outset, the disease will not have a chance to run its nefarious course, socially speaking, and, medically considered, will be the most docile of all diseases, instead of the most obstreperous. Thus we see that when clear-eyed Science effects her best work the outcome is far-reaching, and by one stroke are scattered all those theorists who, safely ensconced in their havens of deep security, have prattled their favorite theories irrespective of what is possible by research work in laboratories.

THE APOTHEOSIS OF THE CIGARETTE.

Fair-minded critics who have watched the modern evolution of medicine have often remarked how very tolerant is this special science toward many things which were tabooed, if not insultingly treated, some decades ago. Alchemy, for instance, was long in the medical Index Expurgatorius and the name of Paracelsus was execrated with the choicest imprecations. Yet no sooner had Mme. Curie discovered radium than considerable thought was given to the banished science, and though the name of Paracelsus is not even now mentioned with reverence, the principles for which he stood are not treated with the accustomed scorn. And what more illuminating than the derided doctrines of Christian Science! Quite recently the *British Medical Journal* issued a number that had many articles written by able men on spiritual or faith healing. While the terms "monstrous" and "outrageous" were hurled at Mrs. Eddy's

octogenarian head, there was yet to remark that between the lines of the several articles were undoubted indications of a *rapprochement*; and, whether the writer was Sir Clifford Allbutt, Sir Henry Morris, Mr. H. T. Butlin, or Professor Osler, he half-confessed to an inherent love for healing by faith. Lastly the cigarette, which used to be classed with "these mundungo's, and a breath that smells, like standing pools in subterranean cells," is undergoing considerable rehabilitation at the hands of a well-known French physician, who proclaims its invincible virtues as an antidote against the parasite which causes cerebro-spinal fever. Having made a study of the habits of forty-three cases in a certain French regiment, he arrived at the following conclusions: 25.2 per cent. were smokers, 30.2 per cent. occasional smokers and 44 per cent. non-smokers. While these conclusions may be objected to on the ground that the high principles of science played no part in them (although by this time the French doctor may have proved how deadly is cigarette smoke to the life of the meningococcus *in vitro*), the novelty of the statement, relieving as it does the heretofore despised pariah from all odium as an unmitigated nuisance, is another indication that the science of medicine is getting more and more tolerant as the years speed by. One point, however, should not be overlooked by the patient reader of these lines, and that is that the smoke which proved so excellent a prophylaxis did not emanate from cigars but from many cigarettes; in fact, the greater the number which had been smoked, the better the immunity.

Prejudices die hard, and mindful of this time-worn axiom we fear that many years will have to elapse before American physicians will regard the cigarette in the favorable light in which it is held by our French confrère. For some reason, which has never been fully explained, the sight of a cigarette in the mouth of an otherwise inoffensive citizen is enough to make the gorge of the average American physician rise in righteous anger, though he may be amiability itself under the onslaughts of the most offensive cigar. Perhaps those specimens of insidious journalism with which all our news-stands are cluttered—the ten cent dreadfuls—have done more to color the average physician's opinions than anything else; and though we have no mean opinion of the average physician's reading proclivities, his prejudices in regard to the cigarette surely can be traced to this source, since no medical journal of any standing prints to-day articles that fulminate against the smoking of cigarettes with its attendant evil, "tobacco heart." But now that the cigarette has really come into its own as a prophylaxis in cerebro-spinal fever, even these much-ridiculed literary ephemera of a passing hour may see fit to write lengthy scientific disquisitions on the cigarette in the treatment of disease, and when this is done we have no doubt that much will be accomplished in lessening those prejudices which are so firmly planted in the mind of the average medical man.

OPINION AND CRITICISM.

MEDICAL SOCIETY LABORATORIES.

In a visit some time ago to the new home of a State medical society, we were shown with considerable pride a small clinical laboratory fully equipped for routine work, and easily accessible to all members. The idea of such a central laboratory and its importance to the practising physician were impressed on us strongly, and it seems well worth while urging a more general adoption of some such scheme by county societies or even by groups of men in isolated communities. The necessity of a certain amount of laboratory work in practical diagnosis and treatment has been referred to in these columns before. The ease with which the difficulties of practically meeting these demands can be obviated are apparent when one considers the central laboratory scheme.

The cost of installing a fully equipped laboratory for routine, clinical, and bacteriological work is comparatively small, and would quickly repay itself because of the greater efficiency it makes possible. The total cost, including reagents, microscope, centrifuge and thermostat would not amount to more than \$200 or \$250; surely a small investment for a group of men. The other difficulty,—that of lack of time for such work,—could also be eliminated by giving some of the younger and less busy men an opportunity to add butter to their bread by doing this work.

GIFTS TO SCIENCE.

The brilliancy of the renaissance in American medicine has been so bewildering that the peculiar economic conditions which have made this renaissance possible have been overlooked. It is probably still true to a great extent that Americans eat and rest not because of necessity or the joy of a fuller life, but because it makes them able to do more work. The capacity of doing more work and easy opportunity have resulted in a distribution of wealth at once unique and American. And yet it has been a striking fact that American millionaires use their wealth for purposes that in older governments might indeed be considered functions of the State. Libraries and schools have been endowed for general education, and whatever we may think of the fundamental error of a privately endowed public institution, we must realize that private individuals succeeded where the State failed in offering educational advantages to children. Medicine and the medical sciences formerly did

not receive their dues, but now it is almost with surprise that we calculate the large amounts given in the last few years to hospitals, medical schools, and scientific institutions. Chicago, New York, Boston, Baltimore, Philadelphia, St. Louis, and many other cities are able to improve their hospital facilities, to raise their standards of medical education, to pay men living wages for the brain and energy required in scientific research; and in almost every case the change has been brought about by gifts from men of wealth. Surely, in no better way could a return be made to society, and society must soon realize, if it does not already, that tremendous benefits are bound to accrue. Not in a day was Rome built, nor in a day shall the change in medicine come; but when the gradual evolution has occurred the advantages accruing to the world will be demonstrated.

HIGHER EDUCATION FOR NURSES.

Advances in the training of nurses have been marked and rapid, especially in this country. No doctor, especially one who has been a patient can do aught but appreciate the efficiency, the care and tact of most of the women who play their own particular role at the bedside, but we will be pardoned if the statement seems ungallant when we say that the training of nurses has not yet altogether succeeded in producing the ideal. The impossibility of attaining ideality should not prevent critical study of the best means to that end. The general function of the nurse to-day is the same as it was at the world's beginning:—to help the sick get well. But just as the physician's training must keep pace with advances in medical knowledge, so in a way must the nurse's equipment vary with time.

Properly to appreciate the situation it is necessary to inquire wherein does the nurse's function to-day differ from yesterday, and why is there any necessity for changes in her education? In the ward or the private home the nurse's first duty is to obey the physician's orders; the second, to do that something which lends an air of comfort and peace to the dismay and confusion of the sick-room. This latter quality cannot be analyzed by mere man any more than can those qualities that lend charm to personality. Obedience to orders means considerably more in the battle by the bedside than it does in the field of war. On the one hand, the soldier charging the enemy under orders from his captain cannot tell the effect of his shot; on the other, the nurse not only must be able to judge the effect, but often it is necessary for her to decide when to fire the shot. Hence blind obedience would result disastrously in many cases, since the nurse must understand as well as obey orders. To understand she must know something about medicine—and the rub lies in deciding just how much she ought to know. Surely during the three years of hard work which constitute the period of learning, she has neither the

time nor the opportunity to learn the practice of medicine, and just as surely does she not need to learn the science of medicine in order to practise the art of nursing. She must, however, almost as well as the physician, be able to see variations in the patient's condition, be able to know that certain changes mean danger and the doctor. Perhaps one can go further and say that the best nurse is one who works understandingly, who is taught to see the reason for certain therapeutic aims. Realizing this point of view, some modern training schools attempt to teach their students more than was formerly taught and the cry of higher education for nurses is heard broadcast. However, there is one fact that requires emphasis; higher education is needed, but it should not be too high. The nurse is an artist, not a scientist, and her education should be to develop her art. It is wellnigh impossible for her to become a scientist during her tutelage, and as a result, on graduation, she does not possess the spirit of the true student toward her studies, but rather she is fascinated by the doing of a thing she enjoys. Consequently her higher education should be along lines that make her practice more perfect, and her interests in her practice more intense.

There are several fields of nursing, however, in which scientific specialism might well be developed. The first, and probably the most important, is that relating to sociological work. The district nurse has for some time been the greatest aid, not only to successful dispensary treatment of patients, but to the more complete handling of the poor by philanthropic institutions and charity organizations. With her special training along medical lines, the properly-selected woman who visits the homes of patients can be replaced by no other agent, and the amount of good she can do to the patient, and to society as a whole, can hardly be estimated. The very intimate interrelations between medicine and sociological problems need not be emphasized further than by calling attention to the impossibility of separating the questions of proper housing for the poor and the morbidity of tuberculosis. In one of the large Eastern cities, the whole handling of the tuberculosis situation in the city proper is managed by visiting nurses paid by the city—a tribute indeed to the power of the trained nurse in sociology and a strong indication of the need for the specialist nurse in sociology.

Another field of usefulness for some chosen few is in the development of trained assistants in clinical research. Probably only those who have attempted experimental studies on patients can really appreciate the importance of intelligent co-operation by the nursing staff for the successful completion of such research. This is especially true in metabolic work where it is extremely difficult to make the average person understand the niceties of weighing the salt of the salad, where indeed the slightest misinterpretation of orders might lead to the loss of months of diligent work. It would be well, indeed, if in every hospital attempting clinical research there were one or two specially trained nurses, whose interest in such work is sincere and whose co-operation is intelligent and com-

plete. These women, as well as the district nurses, should show by their fitness and mental equipment that "higher education," when well applied, results in training that is absolutely necessary in the special fields of nursing.

LITERARY NOTE.

"Are the painters and etchers who succeed in reproducing with considerable exactitude normal and pathological anatomy, equally successful when they attempt to depict the neuropaths?" asks Dr. Lucien Nass in his recent work "*Curiosités Médico-Artistiques*." And he immediately answers the question in the negative. The artists, contends the author, are like the public in imagining that the best way to show neuropathic imperfections is by simple physiognomic expressions—a grimace more or less significant, and by gestures decidedly excessive. In a word, they see only the theatrical side of the picture presented by the neuropaths and the insane, and neglect altogether the real elements that make for clinical verity. But though Dr. Nass is severe in his judgment of artists who have failed to do justice to a truthful representation of neuropathy, he is lenient toward those who have succeeded. For instance, there is Muller, whose celebrated painting "*Pinel Removing the Gyves from the Insane*," in the Academy of Medicine, is not only a work of excellent technique, but a specimen of unexaggerated realism, despite the temptation which must have been uppermost in the artist's mind to accentuate theatrically the contrasting characteristics in the figures. The melancholiac who incessantly weeps, the megalomaniac lost to his surroundings in the happiness of his dreams, the patient afflicted with senile dementia who holds up an iron wrist-band to Pinel to show him what it really means to be freed at last from the manacles, the patient obsessed with delusions of persecution, whose back is turned to the great liberator just to show his contempt for one whose act must necessarily be one of persecution, are all true to life, and show in every line the scrupulous exactitude of a painstaking artist. Built on the same truthful lines is the etching "*Salpêtrière*," by Léopold Flameng, though exception might be taken that the artist overlooked the fact that only women are housed at Salpêtrière. Therefore the maniac who is being restrained by means of a camisole is out of place in the picture. With this exception, unstinted praise should be bestowed on the artist who knew so well how to depict the characteristics of a paretic deep in soliloquy and the tragic attitudes of the other figures engulfed in their respective delusions. Studying the picture one realizes the poignancy and sadness that are the atmosphere of every insane asylum. As regards Albert Dürer's well-known etching "*Melancholia*," Dr. Nass is of the opinion that here we have riotous romanticism at its height; and though there is no denying the etcher's

extraordinary talent, the fair-minded critic must needs deplore his disregard for truth. Melancholia is typified by a woman whose facial expression, at once stern and pensive, is undoubtedly due to the reflection that it is not within the power of man to stop the flight of time. It is said that of all the works of this German master this one exercised the greatest influence on the thought of the century in which it was produced. While this may be true, a criticism, that bewails the absence of a much-desired alliance between philosophy and elemental truth in a work of art, cannot in all justness be considered unfair. In extenuation of the artist's shortcomings as an exact photographer of clinical types, it might be advanced, that in those far-off days clinical matters were not so closely studied as to-day; hence, melancholia meant to Dürer meta-physical thought rather than uncompromising reality.

In Artigue's Salon picture of 1901 called "Inebriation," the neuropathy of intoxication is depicted, the central figure, a houri of the harem, showing the disastrous effects to mind and body from the inhalation of poisonous fumes. The painting has a certain attractiveness from an esthetic point of view, but as a clinical lesson it leaves much to be desired. On the other hand, syncope has been very well represented. The well-known attack which seized Esther in the presence of King Ahasuerus has been pictorially treated by many wielders of the brush. The best painting on this subject, according to Dr. Nass, is Tassaert's, in which the biblical heroine is seen in a condition that is unmistakably syncope, since all the physical signs—the collapsed state of the body, the veiled expression, the pallor, and the tight-closed lips—are graphically shown. Upon viewing this picture, the medical man recognizes at once that the artist must have made a close study of this condition from life. In "The Fainting of St. Catherine," by Sodoma, the languid attitude of the body gives every indication of a loss of muscular tonus, but the facial expression is misleading and exaggeratedly sentimental. But what is most striking is that the two women who are ministering to her wants are attempting to revive her in a most unique manner. Instead of allowing the body to rest on the ground they are strenuously at work holding it up: a mistake to which all painters of this subject must plead guilty. Idiocy, continues Dr. Nass, though far removed from any pictorial attractiveness, has not been lacking in expositors, especially among the Flemish artists. Van Ostade, in his "Idiotic Musician," has depicted a mendicant violin-player whose toothless mouth and stupid grimace were evidently thought by the painter sufficient characteristics to make an exact picture of idiocy! The woman in the lower part of the painting, who is listening to the playing, though supposedly sane, has enough vacuity in her facial expression to make one class her with the mentally infirm. Surely, here is a picture so imaginatively false that no medical man of experience with the insane could possibly construe it into what the artist really meant it to be. When we take into consideration the work of the caricaturists, says Dr. Nass, we see at once that we are in the presence of pictorial

documents that are informed with truth. Could anything be more true to life than Wattier's "The Angry Patient," or Boilly's realistic "Anger?" What painter has depicted with the same verisimilitude the outraged feelings of an irascible neuropath who sits bolt upright in bed, in a state of anger approaching frenzy, because her anodyne potion is not forthcoming! It does not require more than the usual share of imagination to picture to oneself the connubial scene when at last the husband enters and by blandishments attempts to moderate the mental excitation due to egotism and uncontrollable tyranny. The dominating look, the drawn thin lips, the wrinkles that disfigure the face are not unknown to those clinicians who have made a study of this sort of neuropathy. In the second engraving can be seen three men in the throes of anger; not the anger that is easily appeased, but the sort that reminds one of the definition advanced by a clinician—a passing attack of insanity. Looking at these faces distorted by the worst emotion one realizes at once that brains which house only instincts of a low order are incapable of reasoning and judgment. But one also realizes that the exophthalmic eyes and clinched jaws are indications of a mental disorder which, though brief, may be so subversive of the line of demarcation between right and wrong that the wordy warfare may end in something more disastrous. Now, though these caricatures are worthy of praise, it cannot be affirmed that the transposing of neuropathic symptoms from the clinic to the canvas has been attended by any great degree of success.

ORIGINAL ARTICLES.

A MODERN CONCEPTION OF THE PSYCHONEUROSES.*

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In no department of medicine are more divergent opinions promulgated, or more valueless papers written, than on the subject of the psychoneuroses. The reasons for this lie partly in the great complexity and difficulty of the subject-matter itself, and partly in the fact that actual investigation of the problems has up to the present been confined to a small number of workers. One unfortunate consequence of this state of affairs is that the average practitioner, and indeed neurologist, has been led to look upon the subject as being essentially chaotic and vague, and has taken refuge in a few simple conceptions that are either quite superficial or throughout erroneous. Having had no opportunity for personally studying the subject at first hand, he is usually unaware of the fact that there exists in connection with it a large body of precise knowledge, and that the progress made here during the past twenty years has been at least as extensive and valuable as that made in any other branch of medicine. The great need at the present moment is not a fruitless discussion of intricate problems on the part of those who have never investigated them, but the awakening of the medical profession to the fact that in their education there has been an important gap which should be filled. I would strongly urge that what we need is study, and not talk; facts, and not opinions. The weighty lessons of bacteriology were assimilated by the profession only when this subject had been embodied as an integral part of the curriculum at the medical schools, and we cannot hope that the no less weighty lessons of clinical psychology will be assimilated until this likewise has become an integral part of the medical curriculum. Few of those in a position to judge would admit that the study of clinical psychology is less complex, less difficult, or less significant, both for our patients and for society at large, than is that of bacteriology.

I shall here attempt to sketch some of the more important and secure of the modern conceptions of the neuroses, and may state at the outset

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that we owe them to the fundamental work of Freud, who for the first time brought order and intelligibility into the subject.* As Dr. Putnam has dealt with the general questions of etiology I shall confine my remarks in this connection to a single point, one of essential moment. It is highly desirable to bring our views in this matter into line with those on other diseases. Increased knowledge in etiology means an increased precision in estimating the relative significance of the various pathogenetic factors. In place of an ill-defined group of *banal* causes, we come to distinguish a specific cause for each disease, and, by the side of this, various predisposing and exciting factors. For instance, whereas thirty years ago general paralysis was thought to be due to the combined action of a variety of agents, such as heredity, mental strain, alcoholism, and so on, it is now known invariably to result from a specific cause, namely, syphilis, the other factors playing a relatively subordinate part in its production. In the past fifteen years, thanks to the researches of Freud, we have learnt to recognize the specific cause of the neuroses, namely some disturbance of the sexual function; in other words, one maintains that no neurosis can possibly arise with a normal sexual life. I know that this statement must at first sight seem strange. There is a strong tendency in medical circles to discount the significance of the sexual life in general; an illustration of this tendency is the total omission of the subject from medical textbooks and from medical teaching, so that most practitioners do not even so much as know the names of the manifold sexual disturbances. Even the importance of syphilis in disease has been accepted with the greatest reluctance; it took a quarter of a century to establish the syphilitic origin of tabes, and this was done only in the teeth of strong opposition on the part of the leading authorities, including Charcot, Leyden, and many others. Many writers even maintain that it is improper to enquire into the sexual life of patients, and it is curious to note that it is just these writers who deprecate the importance of the subject. Now a man may have the right to refuse to investigate a given matter, but he cannot at the same time pose as an authority on that matter. What would be thought of a physician who taught that it was wrong ever to enquire for evidences of rheumatism in cases of juvenile heart disease, and then at the same time proclaimed that rheumatism played no part in this connection? Yet it is precisely such illogical conduct as this that many modern writers are guilty of in regard to the neuroses. Others admit that sexual disturbances may play a certain part, but would place them side by side with many other factors, and deny that they are in any sense specific. One can most readily criticize this position by drawing an analogy with the acute fevers, scarlet fever, rheumatism, poliomyelitis, and so on. If anyone thirty years ago had enunciated the opinion that these are invariably due to infection with

*As the present paper aims only at presenting Freud's views, this sentence should not be taken as intending to deprecate the value of the work done by Janet, Prince, and others along different lines.

microorganisms, and that other factors play a subordinate and non-essential part, he would certainly have been accused of gross exaggeration and defective judgment. Suppose that to-day a physician were to teach that epidemic meningitis was due to the combined action of numerous factors, such as heredity, ill-nourishment, strain, chill, etc., and that in some cases possibly infection may also play a part? It would surely be said that his perspective of the relative importance of these factors was strangely distorted, and that he could have no true conception of the scope of infective agents. There still survive physicians, untrained in bacteriology, who take precisely this view of poliomyelitis, rheumatism, and similar conditions, and their position resembles that of the majority of the medical profession in regard to the neuroses, who are untrained in clinical psychology.

We turn now to the question of classification of the neuroses. In the past it has been customary to group these according to the symptoms present. For instance, in a quite arbitrary way a large group of symptoms was brought together, and a patient suffering from them was said to have neurasthenia. Other symptoms were said to characterize hysteria, and these two terms, together with the occasional introduction of hypochondria, are still commonly thought adequate to describe all varieties of neurosis. It should be plain, however, that this type of classification is from its very nature a tentative one, only to be used pending further investigation. It reminds one of the old "simple continued fever," which in former years was used to designate a number of conditions that are now known to be quite independent of one another. We cannot rest satisfied with any classification of disease that is based on an arbitrary grouping of symptoms, and every effort should be made to distinguish different types, not according to their superficial characteristics, but on the basis of their pathogenetic origin. Only when we penetrate into the actual nature and etiology of different diseases can we separate the essential from the accidental, and thus differentiate one type from another. It is significant that the most discordant views on classification exist precisely where least is known of pathogenesis and etiology; for instance, in the hinterland of chronic joint affections. Thanks to the researches of Freud we are now in a position to recognize the essential pathogenetic characteristics of the neuroses, and thus to distinguish the different types.

Freud has pointed out that it is necessary to separate the "actual neuroses" from the "psychoneuroses," the fundamental distinction between the two being the fact that in the former the individual symptoms cannot be further reduced and explained by any form of psychological analysis, whereas in the latter the symptoms can be shown to be the last links in a long chain of mental processes. There are two "actual neuroses," neurasthenia and the anxiety-neurosis. Concerning the former the following general remark must first be made. One of the matters on

which investigators are most in accord is that the term neurasthenia is commonly made to include totally different conditions. Since Van Deusen first used the term, over forty years ago, it has become applied over an ever-increasing range, so that Raymond's recent description of neurasthenia as *un géant informe* is only too well founded. In an average medical textbook at least five totally different conditions are confounded in the description of neurasthenia. The wide application of the term is doubtless due to the consolation there is in at least being able to give a name to conditions which are difficult to comprehend, and it depends on two kinds of mistakes. In the first place, many symptoms, such as obsessions, which are in no way part of neurasthenia, are grouped together with it by those who do not know the different pathogenesis of the conditions in question; and in the second place, numerous errors in diagnosis are made owing to the insecure criteria commonly relied upon for this purpose. For many years it has been pointed out by various authorities that conditions grouped under the term neurasthenia are really distinct from this. In 1864 Krafft-Ebing maintained the independence of obsessional states; twenty years ago Janet separated obsessions and phobias under the title of psychasthenia; and fifteen years ago Freud demonstrated the nosological independence, first of the compulsion-neurosis, and then of the anxiety-neurosis. I would say that if a series of cases in which the diagnosis of neurasthenia had been made were submitted to exact analysis it would turn out that the majority of them were really cases of anxiety-neurosis, compulsion-neurosis, or of some form of hysteria; that many were mild or early forms of dementia præcox or manic-depressive insanity; that a small proportion were toxic psychoses, particularly early general paralysis and post-influenzal depression; and that only a minimal number, certainly fewer than one per cent., were really cases of neurasthenia. This being so, it is evident that all hypotheses, such as the intestinal toxin one, which are derived from observation of a series of cases thrown together without any analysis, stand on a very insecure foundation. To take, without any pathogenetic differentiation, a number of cases with functional gastric symptoms, to call them at will neurasthenic, and then to proclaim that neurasthenia is due to a hypothetical gastro-intestinal toxin, is exactly on a par with taking a number of cases of pain in the legs, calling them at will neuralgic, and then to proclaim that neuralgia is due to a hypothetical strain from over-walking. Nevertheless there is a condition to which the term neurasthenia may be applied, just as there is one to which that of neuralgia may be applied, but in both cases it is one that constitutes a residuum after a number of other affections have been differentiated from it. When this has been done, and only then, we have the opportunity of studying the nature and origin of it. True neurasthenia, that is, a condition with pure fatigue, sense of pressure on the head, irritable spine, flatulent dyspepsia, and constipation, none of which symptoms has been secondarily

produced by any of the affections mentioned above, will be found to depend on excessive masturbation or involuntary seminal emissions. The specific cause is the inordinate repetition of some form of auto-erotic activity, of an unsatisfactory nature, which occurs in spite of a painful mental conflict. The psychical energy of the person is being unduly taxed to replace the excitation that normally should come from without. The harmful effect of masturbation is frequently exaggerated, and sometimes altogether denied, the truth being between the two extremes. The relation of masturbation to neurasthenia is one reason, among many others, why the practice should invariably be discountenanced by physicians.

The other "actual neurosis" is given the name "anxiety-neurosis" because morbid anxiousness or dread is the most constant symptom present, frequently dominating the clinical picture, and because all the other symptoms stand in the closest association to this, being best regarded as secondary derivatives of it. The most typical form of the affection is the "anxiety attack," though chronic symptoms are often found during the inter-paroxysmal periods. In an acute attack the dread may be very intense, and is often accompanied by a sense of congestion in the head, with a fear of impending apoplexy, insanity or death; consciousness may be lost. There is a great increase in frequency of the heart's action, with anginal pain, marked palpitation, fluttering and irregularity; it may seem temporarily to stop. General tremor and sweating occur, and the pupils may be widely dilated. Nausea, and sometimes vomiting, occur, and they are frequently accompanied by diarrhea and a free flow of urine. Respiratory symptoms are in some cases very pronounced, the chief being asthmatic attacks with air hunger and a sense of suffocation. Nightmare is a manifestation of this affection. Very frequently the attacks are larval or incomplete, that is, only some of the symptoms appear. The commonest of these are attacks of vertigo, palpitation, sweating, sudden hunger, an imperative desire to micturate or defecate, and feelings of suffocation. They are accompanied by a variable amount of anxiety, though the patient, having his attention concentrated on the physical disturbance, may not directly complain of this. The vertigo is a locomotor one, like that due to eye trouble; the patient feels that the floor is swaying, and that he cannot support himself; the legs feel heavy and trembling, and give way under him. There is no sense of external rotation of objects in a definite direction, as in auditory or cerebellar vertigo. In the chronic condition the patient is in a state of apprehensive expectation, dread, or uncertainty. This anxiety becomes readily attached to any idea that in any way justifies anxiety; it therefore frequently arises in connection with ideas that normally evoke a trace of this, such as thunder, snakes and insects, the dark, and so on. Sleeplessness and general irritability, with a hyperesthesia to auditory sensations, are common accompaniments of this anxious state. Other chronic

symptoms are giddiness, paresthesias simulating rheumatic pains, vasomotor congestions, and gastro-intestinal disturbances, particularly nausea and diarrhea. When one group of symptoms is especially prominent, particularly the respiratory, cardiac or gastro-intestinal, the condition is very apt to be mistaken for organic disease; I have several times seen such cases with profuse sweating, occurring only at night, arouse a grave suspicion of phthisis.

The etiological agents may arise in various ways that it is impossible here to enumerate, but they can all be resumed under the following statement: An anxiety-neurosis is the result of sexual excitation occurring under circumstances in which the mental constituent (desire) is not allowed to reach consciousness. Typical instances of these are the embraces of engaged couples, the employment of certain harmful preventive measures, particularly coitus interruptus, sexual abstinence, particularly when previous indulgence is suddenly given up, such as on the death of the married partner or on refraining from long continued masturbation. The desire is diverted from consciousness and becomes converted into its opposite, namely, dread; morbid dread is sexual desire that the person does not wish to feel. Overwork and other forms of strain act only as exciting factors, and are powerless to produce an anxiety-neurosis unless the specific cause is present. The knowledge of the pathology of the condition thus enables us to carry out a rational and effective treatment, which is otherwise impossible.

We next come to the psychoneuroses proper, and as there is a great deal that is common to the pathogenesis of all forms of these it will be convenient to make some general remarks of uniform applicability. The first step in the understanding of these affections is the realization that the symptoms result from the activity of certain unconscious mental processes, that is, of processes which the patient is unable spontaneously to recall to his memory. If we confine our attention only to those processes that are conscious we are soon struck by the sense of discontinuity in the patient's mental life. We find that a bizarre obsessive thought suddenly arises, like a volcanic island in the Pacific, apparently from nowhere; or that a given harmless object awakes in him an uncontrollable fear, or an outburst of rage. These processes seem to be quite isolated phenomena, they have apparently no connection with the rest of the patient's mental life, and when superficially regarded they are quite inexplicable and illogical. As soon, however, as they are traced by psycho-analysis to their origin, it is found that they are connected with highly significant underlying mental processes, of which the patient was not at all aware. They then prove to be throughout intelligible, and the distress they occasion is shown to be logically quite justified. The island ceases to be a freak of nature, and takes its place in the general rational scheme. The discontinuity of mental life is only an apparent one, and disappears as soon as one realizes that only a part of that life is conscious, another

equally important part being unconscious. The knowledge of various unconscious mental processes given us by Freud has proved illuminating, not only in the case of the neuroses, but also in the so-called normal, a theme that it would be out of place to discuss, and it has thrown a bright light on a number of matters that were previously obscure and incomprehensible. Without this knowledge it is quite hopeless to attempt to solve the many riddles of the psychoneuroses.

The next question is the source of the pathogenic activity of these unconscious processes, or rather the source of the unconsciousness of the processes; for, strangely enough, this is only another aspect of the same question. Their harmful effect is due to the fact that they are unconscious, and vanishes as soon as they are again made conscious; it is on this empiric knowledge that the invaluable psycho-analytic method of treatment is based. The processes in question are unconscious because they have forcibly been made so by a defensive act on the part of the patient. They concern memories that the patient wishes to forget, and cannot bear to recall, from which the patient has striven to get away; they are disagreeable to him for reasons such as shame, disgust, conscience, and so on. The occurrence just mentioned is technically described by the term "repression." Further study of the pathogenic repressed processes reveals the fact that they are always of a dynamic nature: that is, they represent a striving, a tendency, or, most simply expressed, a wish. This is a very important matter, for it will at once be noticed that it contradicts the current opinion that static mental processes, such as a painful shock, grief, etc., are operative in the causation of hysterical symptoms. It gives us a new point of view, for we can now describe the splitting of consciousness, or psychological disaggregation, which has long been known to be at the basis of hysterical symptoms, in terms of mental conflict. The symptoms arise as the result of a conflict between two forces, one of which is a wish that is striving to realize itself consciously, the other of which is an effort to keep back all knowledge of this wish, to "repress" it. Neither of these forces is entirely successful, and the result is a compromise, which clinically is called a symptom. The "repressed" wish comes to fulfilment in the patient's unconscious phantasy, but is not admitted to external expression until it has been distorted by the repressing action of the opposite force, which is termed the endopsychic censor. We can therefore formulate the general statement that every psychoneurotic symptom is the disguised manifestation of a repressed wish-fulfilment. Neither force altogether succeeds, or altogether fails. The wish is not expressed in its native form, but undergoes distortion; and the censor fails to achieve its object of preventing the wish from reaching consciousness, but succeeds in preventing the significance of this from being realized.

When the whole process is elucidated it becomes evident that the underlying dynamic forces, or wishes, are in every case of a sexual nature.

The symptoms thus represent a perverse form of unconscious sexual gratification, a fact which explains the persistency with which so many patients cling to them. There is always an unconscious resistance against getting better, for giving up the symptoms means renouncing a certain amount of sexual gratification, in many cases the chief one open to the patient. This dogmatic statement may sound strange, but it is a question that can only be decided by actual experience, and all those who have succeeded in unravelling such symptoms to their origin are unanimous in supporting this conclusion.

The actual pathogenesis of psychoneurotic symptoms is far from being as simple as I have just schematically indicated. In practice one always finds that a symptom results not from one submerged wish, but from many. In the series of unconscious psychical processes that underlie a given symptom are woven a great number of actual experiences that the patient has lived through. The memory of these experiences has in many instances got lost, through the process of repression. This is because the memories have become associated in the most complex manner with submerged wishes, so that the mental processes in question are exceedingly intertwined. On disentangling then one finds that the energy that goes to make up the symptom is derived from various sources, some of recent date, others of older. In every case, however, the most essential sources are those of earliest date, namely, in the first half of childhood. These are present in every case, so that one may lay down the general law that nothing happening to a child after the age of six can cause a psychoneurosis. Later experiences, of whatever kind, are only significant in this direction if the specific causes have already been in operation before this age. The importance of this for prophylaxis is obvious. The specific causes in question are various sexual experiences in early childhood, of a kind that I have here no time to describe. Freud has shown that the sexual life of children, though widely differing from that of adults, is far richer and more significant than is commonly supposed. From the early tentative sexual trends are developed on the one hand the relatively precise sexual functions of adult life, and on the other a great number of non-sexual mental capacities and activities. The early development of the sexual instinct is a highly delicate one, and one peculiarly prone to errors both of direction and of intensity.

The statements here made apply to the three forms of psychoneurosis, though there are special psychological features of each form. The best known type is the classical hysteria, which Freud terms "conversion-hysteria," on account of the conversion of psychical disturbances into physical symptoms that is its chief characteristic. The second type is the most frequent, namely, "anxiety-hysteria;" in it both the cause and the effect are psychical, the symptoms constituting one of the several varieties of phobias. The third type is the "compulsion-neurosis," of which the commonest and most important manifestations are the obsessions.

In conclusion I would again say that the knowledge gained by patient and thorough investigation of the pathogenesis gives us both a stable foundation on which to build our conceptions of the nature of the neuroses, and at the same time the power to deal radically and successfully with these most distressing of maladies.

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SECONDARY GASTRIC MANIFESTATIONS IN
CHRONIC APPENDICITIS.

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The frequency with which gastric or epigastric symptoms takes the patient to the physician is evidenced by the records of every internist. The infrequency with which the cause of these symptoms is primarily in the stomach has been a matter of very great interest to me. A careful analysis of over 1000 records of cases in private practice, in at least one-half of which gastric analyses were made, convinces me that no less than 50 to 75 per cent. of the patients complaining of dyspepsia, acute or chronic, have no primary gastric affection. This is especially true of those cases of protracted indigestion which have not responded to any form of rational medication, dietetics, and hygiene.

The stomach acts as a sort of constitutional barometer, indicating through a perversion of function the existence of disturbances in other portions of the body, especially within the abdomen, and more especially along the gastro-intestinal tract.

Under normal conditions the individual takes cognizance of but two acts associated with digestion—namely, the ingestion of food and the evacuation of the remnants thereof. From the time the food passes the constrictors of the pharynx, until the feces enters the rectum, the normal individual is not cognizant of any other stage of digestion. If, however, there is a pathological lesion anywhere along the gastro-intestinal tract, it may manifest itself partially, largely, or wholly through gastric manifestations. In every case, therefore, of chronic dyspepsia which has not yielded to rational treatment, it is the part of wisdom to think always of the possibility of a primary lesion in some other portion of the gastro-intestinal tract. For not infrequently (1) the symptoms on the part of the organ primarily involved may be so slight as not to attract the patient's attention, until the reflex gastric manifestations appear; or (2) often this primary lesion causes no subjective symptoms at all on the part of the organ in which it exists, ultimately, however, revealing itself in reflex gastric disturbances; or (3) an acute trouble in this organ may have subsided entirely leaving a chronic affection, which, while causing no local symptoms, keeps up more or less dyspepsia.

As an example of the first class, the initial evidences of pulmonary tuberculosis, which, at least, the patient thinks worthy of consideration, are often the stomach symptoms. Prior to this there may have been no symptoms attracting the patient's attention to the lungs, or he has paid no heed to a slight cough, night sweats, or a "flushing up" in the after-

noon. If he has taken cognizance of these manifestations at all, he comes to the physician only after the stomach symptoms have appeared, complaining of "stomach trouble," asserting that he has a "stomach cough," that he has "no appetite" as a result of his stomach trouble, and that he "sweats at night" on account of general weakness. Had not the stomach asserted itself here, a case of tuberculosis would have passed the stage where a cure may still be effected.

As an example of those cases in which the lesion may have caused no local symptoms at all, I might mention appendicitis larvata or latent gall-stones which have been accompanied by no colics, no jaundice, in fact, none of the so-called "cardinal symptoms" of gall-stones. These cases usually come to the physician complaining of symptoms referable entirely to the stomach, or epigastric region. They have usually exhausted every measure employed in gastric therapy, including diet, starvation, lavage, medicine of every description, etc., without relief. The mistake here has been in the effort to relieve symptoms without first discovering the cause. It is a well-known fact that a very large percentage, a large majority in fact, of gall-stones produce neither colic nor jaundice. Therefore, if these symptoms are depended upon for the diagnosis, a vast majority of gall-stone cases go unrecognized.

As an example of another class of affections producing secondary gastric symptoms, we have those cases which give a definite history of a previous acute disturbance in the right iliac region accompanied by periodical attacks of vomiting, pain, fever, etc., which acute trouble may have existed many years ago, perhaps in childhood; finally subsiding, however, and leaving only a protracted gastric disturbance without any local manifestations on the part of the appendix. In these cases the patient will often have forgotten entirely the existence of the previous acute abdominal attacks and will come complaining solely of the gastric manifestations.

Indeed, diseases of any vital organ of the body may manifest their first evidences to the patient and to the physician through the stomach. The first evidence of a brain tumor, for instance, may be vomiting, and not infrequently locomotor ataxia is recognized through its gastric manifestations. Heart diseases, especially those accompanied by arteriosclerosis and manifesting themselves in angina pectoris, are often misinterpreted by the patient as stomach trouble, because of the close proximity of the organs, and because overdilatation of the stomach by either food or gas may precipitate attacks of angina pectoris, dyspnea and palpitation in persons with diseased coronary arteries, valvular lesion, etc. I have seen cases, in fact, where it was almost impossible to differentiate between acute gastric manifestations and angina pectoris, which the autopsy afterwards showed to be due to a sclerosis of the coronary arteries. The frequency with which reflex gastric manifestations occurs in involvements of the uterus and adnexa is only too well known. Le-

sions anywhere along the gastro-intestinal tract, be they in the esophagus, the stomach itself, the gall-bladder, liver, duodenum, pancreas, small and large intestines, rectum, or the appendix vermiformis, may present their first, yes, their only symptoms through gastric or epigastric manifestations.

Another class of cases in which the stomach symptoms are usually the most prominent, always associated, however, with nervous phenomena of a great variety, are those so ably described by Stiller—viz., the enteroptotic habitus. Persons of this type are from birth candidates for nervous dyspepsia, and the state of malnutrition which characterizes them sooner or later brings with it a long train of dyspeptic symptoms. These cases often put great obstacles in the way of a differential diagnosis from cases of appendicitis larvata here under discussion. They are easily recognized through the general lack of development—namely, long, slender thorax, acute costal angle, floating tenth ribs, flabby, thin, abdominal walls, floating kidney, pulsating abdominal aorta, gastropptosis, etc. The superficiality of the large nerve plexuses in the epigastric and iliac regions, together with the lack of muscular tone of the abdominal walls, permits of pain on very slight pressure over the regions where we depend largely upon pain phenomena for the diagnosis of organic lesions.

Every case of "stomach trouble" coming to the physician becomes at once a problem calling for a most careful investigation. The difficulty of solution will depend upon whether the cause lies primarily in the stomach itself, or very remote from it. The successful solution will depend upon the eliciting of a careful and complete history, the application of laboratory examinations, including the urine, blood, stomach contents, feces, etc., and a most painstaking physical examination covering not only the gastro-intestinal tract, but often the nervous, circulatory, respiratory, and genito-urinary systems as well.

The analysis of my records shows that by far the largest percentage of secondary gastric manifestations or secondary dyspepsias, as we may term them, are in persons with the enteroptotic habitus and malnutrition, gall-stones, and chronic appendicitis. It is to the latter especially that I wish to call attention; more especially, however, to those cases of chronic appendicitis manifesting no subjective local symptoms, at any rate none to which the physician's attention is directed by the patient. In these cases the process may have assumed the chronic latent type without the pre-existence of any acute manifestations, or the acute manifestations having existed, have long since subsided and perhaps have been forgotten. These patients present themselves complaining of chronic indigestion of the most distressing character, having existed sometimes even since childhood,—eructations of gas, fullness and distress in the epigastrium after eating, occasionally vomiting, heart-burn, and not infrequently severe periodical attacks of epigastric pain or pylorospasm. Those cases in which these pylorospasms occur may resemble in character gall-

stones, ulcer of the stomach, and duodenal ulcer. I have met with cases simulating various primary gastric disturbances, such as gastritis, ulcer of the stomach or duodenum, hyperchlorhydria, etc. Only too often in these chronic dyspepsias, because of various nervous symptoms, the case is entered as one of gastralgia, nervous, dyspepsia, neurasthenia, or hysteria. Experience has taught me that the more carefully one investigates gastric phenomena, primary and secondary, the further does one get away from the diagnosis of nervous dyspepsias and gastric neuroses. They were vastly more commonly entered in my early records than in those of recent years. We seem often to forget that neurotic persons may have become so through long years of suffering, due to some overlooked lesion, or fail to take into consideration the fact that a neurasthenic may have an organic lesion. The more pronounced the neuropathic tendency in an individual, the more pronounced and varied the symptoms that a given lesion may produce; hence, the more difficult of interpretation. Not infrequently have I seen protracted chronic dyspepsias, that have been treated, either as primary stomach troubles or as nervous dyspepsia, disappear promptly through the removal of an apparently insignificant, adherent, shrivelled appendix, which had not even been suspected through the years of suffering by either patient or physician.

Primary disease of the stomach, acute or chronic, especially the latter, reveals itself usually in disturbances in gastric secretion or motility, or both. Therefore, chronic gastritis, chronic ulcer, Reichman's disease, achylia gastrica, cancer of the stomach, gastroptosis, gastrectasia, myasthenia gastrica, in fact, primary diseases of the stomach in general are in a large majority of cases not difficult of diagnosis.

The first step then in the proper interpretation of gastric or epigastric phenomena is a thorough examination of the stomach itself, including the determination of both the motility and the secretion. The motility of the stomach in the class of cases here under discussion is usually normal, unless through a loss of weight and strength and accompanying muscular atony there has developed a state of myasthenia gastrica. This, however, occurs chiefly in those cases attended by a high degree of malnutrition.

While the acidity may be found considerably above or considerably below normal, as a rule we have found it within normal limits. In several of my cases, however, there was an almost complete anacidity, while in others the acidity was so high as to lead one strongly to suspect ulcer of the stomach. Both Moynihan and Paterson state, in recent articles, that they have been misled through symptoms and gastric findings into operating for ulcer of the stomach, only to find that the appendix was at fault. In a large majority of cases of chronic appendicitis with pronounced gastric symptoms, both the motility and the secretions will be found within normal limits. This should at once lead one to suspect that the primary lesion is elsewhere. In these cases it has been my practice, when a thorough examination from every standpoint leaves the mat-

ter still in doubt to recommend exploration, which, in the hands of competent surgeons is attended by far less danger than is procrastination. We should not hesitate to call upon the surgeon to aid in diagnosis through the exploratory incision after we have exhausted every means at our command of arriving at a diagnosis. On the other hand, exploration should never be resorted to until this has been done. When surgery is indicated in circumscribed diseases of the abdomen it gives a promptness and certainty of relief which internal treatment can rarely offer.

The following are a few cases selected from a large series, exemplifying the variety of epigastric phenomena that may be produced by a chronic appendicitis without local symptoms.

Case 1. L. L. M., age 30, complained of stomach trouble ever since childhood, characterized by more or less constant indigestion necessitating great care with his food; sour stomach after indiscretions in diet and soreness in the epigastric region for several days afterwards. Periodical attacks of vomiting, with severe headaches occurring several times each year. On one occasion vomited blood-stained mucus. Patient recalls that as a boy at school he had abdominal cramps which often necessitated his lying flat on his abdomen for relief. The examination revealed a slender, anemic young man, underweight, small bony frame, enteroptotic habitus, with movable right kidney, acute costal angle, pulsating aorta. The stomach normal size and position. Sensitiveness on pressure in the epigastric region just under the xiphoid in the median line. On pressure in the right iliac region pain radiated toward the epigastrium and produced nausea. Meltzer's sign decidedly positive, pressure in the left iliac region caused pain to radiate to the right. The examination of the test meal showed practically normal secretions and motility. This patient was kept under observation for two weeks and then recommended for operation. A tightly adherent, retrocecal appendix was removed with considerable difficulty by the surgeon. A year and three months have elapsed since the operation, and during this time the patient has been entirely relieved of all gastric disturbances, as well as the periodical attacks of headaches which had racked him since childhood. This patient has been variously treated for chronic dyspepsia, nervous dyspepsia, neurasthenia, etc.

This case exemplifies beautifully the type in which acute appendicitis had existed in childhood, the acute manifestations having entirely subsided and were entirely forgotten until brought out in the history.

Case 2. Mr. F. A. G., age 25, has had stomach trouble for four years, characterized by severe periodical attacks of burning pain in the epigastrium several hours after eating, usually occurring about 10 A. M., 4 P. M., and midnight. At times the attacks were so severe as to interfere with his work. Often relieved by taking food. Feels best when reclining. Pain sometimes occurred soon after eating, but this is not the rule. Often awakened out of his sleep by the pain. No vomiting or nausea, but frequently sour stomach; many articles of food that he has been unable to eat since the inception of his trouble. Recalls at no time in his life any symptoms referable to the right iliac region or lower abdomen. Has never been jaundiced, never vomited or passed blood. Examination shows the stomach normal size and position. Pressure in the epigastric region just to the left of the median line elicits local pain. Pressure in the right iliac region, McBurney's point, elicits intense pain in the epigastrium and

only a slight tenderness at the point of pressure. Meltzer's sign decidedly positive at times, at others only slightly so. The examination of the stomach contents shows the motility to be excellent and secretion normal, contents well chymified, free hydrochloric acid 48 to 60, total acidity 65 to 75, no occult blood, no evidence of stagnation. The feces on a restricted diet shows no blood. Based upon the negative gastric findings and the positive signs in the right iliac region, the diagnosis of chronic appendicitis was made, and operation recommended. A thickened, tightly adherent, retrocecal appendix with a dilated tip, was removed. The epigastric symptoms were so characteristic of duodenal ulcer that it was determined before the operation to explore the epigastrium also. After the removal of the appendix this was done and no evidence whatever was found of ulcer, gall-stones, or any other lesion there.

My first impression of this case was that of ulcer. Prolonged and careful observation, however, extending through a period of weeks, made a proper diagnosis possible. In this case chronic appendicitis developed without the pre-existence of acute symptoms, and throughout his trouble there had never been a single symptom attracting the patient's attention to the right iliac region.

Case 3. Miss K., age 40. During the last year and a half has had more or less constant pain through the lower epigastric region extending into the right hypochondrium. The pain depends in no way upon her meals, excepting perhaps that she feels much more comfortable when the stomach is full. The pain is described as of a "throbbing toothache character" that extended through to the back, at times under the shoulder blades. The pains are never sharp or acute. Has lost ten pounds in weight in the last years. Ten years ago the patient had had frequent attacks of acute pain in the epigastric region, which at times necessitated hypodermic injections for relief. There had been no jaundice, no nausea, no vomiting. These periodical attacks were apt to occur at any time regardless of food. The examination revealed a typical enteroptotic type with an acute costal angle of 40 degrees, floating tenth ribs, pulsating aorta, gastropstosis, movable right kidney, second degree. In the right iliac region at McBurney's point is an exquisitely sensitive area on pressure, with a very positive Meltzer's sign. When slight pressure was exerted over McBurney's point she was scarcely able to raise her leg on account of pain. The hypochondrium was entirely free. The examination of the stomach shows a perfectly normal motility with practically normal secretions, free hydrochloric acid 48, total acidity 75, peptogenic power 60 per cent. Urine, feces, etc., normal. The character of the early attacks in this case reminded one of gall-stones; however, the positive findings in the right iliac region together with normal conditions in the stomach led to the diagnosis of appendicitis. The operation revealed an almost completely obliterated appendix with only a small portion of the mucosa preserved in the tip. The gall-bladder was found perfectly normal.

The enteroptotic type in this case might have accounted for the symptoms had it not been for the early history of acute periodical attacks in the epigastrium. Over two years have elapsed since this patient was operated, without any recurrence of her former symptoms.

Case 4. Mr. B. E. B., age 30, was always in excellent health until two years before, when without any definite cause began having periodical attacks of vomiting accompanied by pains in the epigastrium; at times they were rather

severe and of a burning character. The attacks usually lasted from 24 to 30 hours. In the last two years he had four vomiting attacks, two of them being entirely free from pain. In the interval, patient is in a perfect state of health without even the slightest degree of indigestion. He lost but little weight and is in a fairly good state of nutrition. The physical examination made during an attack revealed marked tenderness in the epigastrium with visible peristaltic waves passing from left to right. The size and position of the stomach was normal. The examination of the stomach contents shows a marked degree of retention with superacidity, free hydrochloric acid 44, total acidity 91, peptogenic power normal. There was an area of exquisite sensitiveness over the region of the appendix on very slight pressure. Aside from this point and the point in the median line in the epigastric region, the abdomen is fairly free from pain on pressure. Pressure over the appendix region often caused pain to radiate toward the epigastrium. The diagnosis of chronic appendicitis accompanying gastric ulcer or gall-stones was made, and operation recommended. Patient declined operation until six months later when his suffering made it imperative, the attacks becoming more frequent and more severe. The first incision was made over the appendix removing a chronically inflamed adherent appendix with a strong fibrous band saddling the ileum. The second incision was then made in the epigastric region; the gall-bladder found entirely free. On the lesser curvature of the stomach was a saddle ulcer with adhesions, it formed an inflammatory mass up under the liver almost as large as an hen's egg, not obstructing the pylorus, however, to any great extent. A gastro-enterostomy was done with a Murphy button. The patient made a complete recovery and was free from all symptoms of gastric disturbance until a year later when he had a vomiting attack resembling somewhat those that had gone before. Examination revealed a mass in the stomach, which was taken for the Murphy button on account of its mobility, and this was confirmed by the x-ray. A second operation was performed in which the button was removed, since which time the patient again has resumed a perfectly normal condition.

In conclusion permit me to lay stress on the following points in arriving at a diagnosis of chronic appendicitis with gastric phenomena:

- (1) A careful history should be taken with special reference to the previous existence of acute abdominal attacks, perhaps as far back as childhood.

- (2) Primary gastric diseases should be excluded through a determination of the motility of the stomach, careful, and if necessary, repeated examination of the stomach contents, bearing in mind that there may be co-existing lesions in the stomach and appendix and that in a small percentage of cases the acidity may be greatly increased simulating ulcer, may be diminished arousing fears of carcinoma, but as a rule is found within normal limits. In a differential diagnosis careful examinations of the feces for blood, and of the urine, and examinations of the blood itself, will often throw light upon obscure cases.

- (3) Pure gastric neuroses, the expression of a neuropathic tendency, though less common than usually supposed, must be excluded, not forgetting, however, that organic lesions may be encountered in neurotic individuals.

- (4) Especial care must be taken in cases of habitus enteroptoticus

(Stiller) not to misinterpret the physical signs often elicited in these cases in both the epigastric and right iliac regions.

(5) Through the careful physical examination other organs, especially the abdominal, must be excluded as a causative factor, not forgetting again that two lesions such as gall-stones and appendicitis are not uncommon in the same individual.

(6) Lastly, there must be a most careful examination of the right iliac region for positive findings, bearing in mind, that in exceptional cases of chronic appendicitis no local signs can be elicited.

In the examination of the appendix region one or more of the following signs may be present: (a) Local pain on pressure over McBurney's point. (b) Pain radiating toward the epigastrium on pressure over the cecum without, perhaps, any pain at the point of pressure. (c) Epigastric distress and nausea on pressure in the appendix region. (d) Meltzer's sign, which consists in pain produced through the elevation of the right leg of the patient while exerting pressure over McBurney's point. (e) Pressure in the left iliac region or other portions of the lower abdomen may cause pain to radiate to the right iliac region. (f) Spasticity of the cæcum. (g) Borborygmus in the cecal region on manipulation. (h) Exceptionally, in very slender individuals, the palpation of the thickened appendix. (i) Pain and infiltration on right side occasionally elicited through rectal examination.

TREATMENT OF TYPHOID FEVER.

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In the treatment of typhoid fever the individual is far too frequently lost sight of. We are too apt to forget that it is of quite as much importance what sort of man has acquired the disease, as what it is the man is suffering from. In a short paper one can hardly treat the subject adequately or exhaustively because typhoid manifests itself in many clinical forms. We might make division as follows, based upon the condition of the subject:

1. According to age; (a) of children, (b) of the aged.
2. According to previous condition of health; (a) of cachectics, (b) of the obese, (c) of drinkers, (d) of the tuberculous.
3. According to the existence of another infection: (a) so-called typhoid malaria, (b) laryngo-typhoid, (c) pneumonia typhoid.

This may seem an elaborate subdivision, yet it is the one which has recently been proposed by Roger.

The diagnosis calls for hardly a word, yet I fear that in the absence of the Widal reaction we are apt to exclude typhoid perhaps too frequently. As clinicians we recognize the fact that an enlarged spleen and rose spots are almost invariably to be found before the Widal reaction becomes positive. Even with the positive Widal reaction and a fever which simulates typhoid fever, the absence of rose spots would lead us to consider tuberculosis. Appreciating the importance of Widal's contribution to our diagnostic resources, we should not be forgetful that headache, sleeplessness, pharyngitis, particularly dry yellow palms, and even albuminuria, are valuable aids in diagnosis.

We hear much of the serum treatment of typhoid fever. The promises which it early aroused have by no means been fulfilled. The explanation probably lies in the fact of the slow diffusion of the typhoid toxin and its rather varying action. Its maximum of toxicity is apparently from five to six days; the larger doses causing diarrhea and death from hypothermia, whereas the smaller doses cause fever and death from cachexia, certainly two very decidedly varying conditions from difference in dose. And as a control upon the serum treatment the opsonic index is by no means reliable, though generally exhibiting itself high early in the disease and approaches normal as convalescence sets in. On the other hand, in paratyphoid fever the variations of opsonic index are more early determined; and further either the induced or the spontaneous phagocytability of the typhoid bacillus is inconstant and

variable. Yet in spite of all theoretical objections it may be safely said that vaccination against typhoid fever should be practiced.

Feeding. Milk for many years has been advised as the ideal food for patients suffering from typhoid fever. It is well known that this plan has many objections. In the first place, the patient needs more carbohydrates than milk contains. In the second place, none can tell in a given patient whether or not the milk will form a curd in the alimentary tract, which curd is likely to be followed by worse results than the administration of solid food. Predigesting the milk does not always obviate this disadvantage. Whey is valuable and yet the increased bulk of fluid leads to a careful examination and watching of the heart. If we have a weakened myocardium serious results will supervene. Then again a large amount of liquid is very apt to be marked by increase of meteorism.

Therapeutic fasting, not starvation, is often preferable to the administration of a large amount of milk. On the other hand, if for a part of this milk or for a little of it, nitrogenous foods be administered a rise of temperature is pretty apt to follow. If, however, we employ carbohydrates in these patients, barley or rice water, the temperature is quite likely to fall. The essential part of the feeding, as we understand it, would seem to be a moderate amount of milk—say eight ounces four times a day only, or malted milk, or milk with a carbonated water. Yet the substitution of albumin water for a greater or less portion of the milk will be of benefit. Soft boiled eggs and custards are advisable.

More recently it is claimed that a diet free from milk results in an absolutely diminished amount of tympanites and lessened delirium, but these statements must be accepted with a certain amount of reservation, because the observations have been carried out with patients in the later stages of the disease and with a more generous diet such as rice, various broths, and with a few crackers or toasted bread as carbohydrates. Still it is worth while to consider that perhaps we have been too much in the habit of administering milk, when milk sugar is a preferable substitute or even cream and that in the future our diet should be more generous and of a somewhat different character. More recently gelatin has been advised as a valuable adjuvant in that it adds a relish to the various liquids, and specifically that it lessens nitrogenous waste, and theoretically prevents hemorrhage. A few observations show that it is not well tolerated in various aggravated diarrheas.

Generally speaking it would seem that frequent feeding is illogical, for the patient generally protests against food, and as the area of food absorption is the one affected by the disease; therefore, excessive food as regards absorption furnishes more culture medium for bacteria and increases fermentation with still greater disturbance of function and further decreased absorption. And these facts will support the statement made above of therapeutic fasting which is not necessarily starvation.

The question of alcohol is of considerable importance. If we quote Kerr, that alcohol by its direct toxic action, through its lessening and

vitating the blood supply to the brain and nerve centers, secondary poisons are retained in the blood, we would be inclined to limit or even prohibit its use. Clinically we know that delirium is rare in patients who have not received any alcohol. We know further that circulatory failure in typhoid is rare, therefore, the need of alcohol is probably not so great as we have hitherto supposed. And in addition we object to alcohol on account of the disturbance of the kidneys which is by no means infrequent in typhoid fever.

Nursing. So far as nursing is concerned the textbooks are sufficiently explicit upon the subject. Perhaps one caution is necessary: that dimly lighted rooms are not to be desired. In fact, an active delirium sometimes is lessened when the patients are able to see distinctly and to interpret properly the objects which they see. As to nursing, it should be practically insisted upon that anyone who has charge of the excreta of typhoid patients or even occasionally engaged in that capacity should have nothing whatever to do in preparing the food for other patients.

At this late date the Brandt bath, or more correctly, the Currie-Jürgensen bath, needs no discussion. The literature has been extensive; and it is well known that it is by no means as popular as it was a decade ago, and it is doubtful if its use will be heard of at the end of another decade. Cold sponging is the only form of hydrotherapy. And even to the devotees of the Currie-Jürgensen bath, children, old people and nervous individuals, present apparent contraindications. For those who look upon fever as a pathological entity which must be combatted, the suggestion is made that a Leiter coil through which ice water circulates placed over the heart, will be more beneficial than any number of cold baths carried out with the most elaborate and painstaking technique.

More recently in place of the bath has been advised a hydrochloric acid lemonade, two to four quarts daily administered at a temperature of 50° F., which is claimed to absorb heat from the tissues and tends to reduce temperature.

Treatment. If one looks over the literature, more particularly of recent years, the one thought seems to be some method of intestinal antiseptics. It is perfectly reasonable and it is an actual fact that the alimentary canal cannot be made aseptic, nor, indeed, for that matter, can the surgeon's hands. On the other hand, no one doubts but that it is possible so to treat the alimentary canal and its contents that bacterial activity will be inhibited, and in the inhibition of bacterial activity we find the proposals for treatment of enteric fever. For instance, the old injunction that the alimentary canal must be freely and thoroughly cleansed by the administration of calomel, either as one massive, or in minutely divided doses, is something more than a tradition. It is a practice of which the results have been obvious. More recently we have more energetic efforts toward not only cleansing the alimentary tract but in inhibiting bacterial activity, such as we see in the administration of silver nitrate, of which

two grains were dissolved in ten minims of diluted nitric acid with an ounce of mucilage of acacia and an equal amount of distilled water as a vehicle. Of this mixture from one drachm in two ounces of water can be given three to four times a day. Twenty grains of metallic silver seem to be necessary to cause argyria, therefore, we need take no fear of causing permanent staining of the skin.

Another method is the administration by the rectum of five drops of phenol in a pint of sterile water, the foot of the bed being lifted and this injection made very slowly. Another method, more especially applying to the renal typhoids, is the giving of hexamethylenamin, in doses of from thirty to forty grains daily to patients. Among other and perhaps less used remedies has been the administration of salol or zinc phenolsulphonate or copper arsenite. From this it is evident that the theory underlying the treatment has been the inhibition of bacterial activity, and this is doubtless the correct theory, if we expect practical results.

A method reaching these results toward which I have directed most of my personal study, and the plan which has yielded the best results in my hands has been the administration of the compound solution of chlorine, which is official in the United States Pharmacopeia, in doses of one drachm every three to four hours, diluted in at least two ounces of water. This can be given until all fetor of discharges is lost and until the temperature becomes normal. Objection has been made that the chlorine was changed in the stomach into an alkaline chloride and so becomes inert; but slight observation is necessary to prove that some at least passes through the intestine in its original form for its odor can be detected in the feces, and not only that but the feces are frequently stained. We know further that free chlorine is taken up by the blood for it has been found *post mortem* in the ventricles of the brain. We can safely say that with the use of this method (1) chlorine can be safely administered without fear of digestive or other disturbance until bacterial activity in the alimentary tract is markedly inhibited. (2) That under its use the tongue becomes cleaner and appetite and digestion improves, the fever is lower, and the stools are devoid of odor save that due to the chlorine. (3) The general health, intellectual processes and nervous conditions improve. (4) The duration of the disease is shortened and the patient usually proceeds to a rapid and full recovery. Now some fifteen years' experience leads me to believe that the mortality in enteric fever should be not over 2 per cent., and the duration of the disease not more than sixteen days; that the results are striking, and if one examines a series of temperature charts, that fever ceases to be a bugbear and the old annoyances after the use of cold bathing are absent. Nor even need we consider the modern theories of the so-called Brandt bath, viz., for the elimination of toxins by the way of the kidneys, for whatever the Brandt baths are supposed to accomplish can be more easily obtained by the use of the rectal irrigations of the colon by normal saline solution passed through the rectal tube, the irrigator

about three feet above the patient and the temperature of the solution about 112° F., and this to be repeated twice daily. Nor indeed in carrying out the chlorine treatment of typhoid fever are we particularly disturbed nor do we particularly insist upon even a suggestion as to diet, which we have above mentioned, for with the rapid convalescence and the absence of symptoms, and the general comfortable feeling of the patient, the question of diet becomes one of minor importance.

Of the symptoms which call for temporary medication, the irregular heart is usually improved by the administration of 1/100 to 1/60 grain of strychnine for a few hours. Ergotin hypodermatically will relieve the headache so marked in the early stages of the disease. Sometimes a dose of ten grains of acetylsalicylic acid is equally effective. Considering the comparative frequency of inflammation of the parotid glands a clean mouth must be maintained, and if tenderness supervenes 1/40 to 1/20 grain of pilocarpine has prevented suppuration. Hemorrhage under the chlorine treatment is practically unknown. However, should the stools be blood stained, calcium chloride in thirty grain doses, well diluted, once a day, will usually increase the coagulability of the blood so that no untoward results need be expected.

The recent French literature calls attention to what has been termed real typhoid fever, typhoid fever of the kidneys, and the general conclusion is that it is really a typhoid septicemia, although the syndrome rarely becomes serious. When one considers the observations of Richardson as to the frequency of the presence of the bacillus of Eberth in the urine and its excretion in the urine, even lasting many months after apparent recovery from enteric fever, it is well, as a matter of routine practice, to administer moderate doses of hexamethylenamin, say ten grains daily to the patient suffering from typhoid fever. One realizes that this subject has been inadequately treated when one considers the mass of literature which is in existence and which is yearly being added to in the journals.

My purpose in this brief paper has been chiefly to call attention to that which in my practice has yielded the best results, and incidentally to mention the more recent suggestions which have lately appeared in the literature.

THE OPERABILITY OF GASTRIC CANCER WITH A PALPABLE TUMOR.

By ALBERT E. TAUSSIG, M. D., of St. Louis.

In spite of all the refinements in gastric diagnosis that have been introduced within the last ten years, we internists must regretfully admit that we are rarely able to diagnose a gastric cancer sufficiently early to admit of permanent cure by means of radical operation. Emaciation, cachexia and coffee-ground vomit are, of course, late symptoms. But so are usually, though to a less extent, the characteristic changes in the gastric chemism, the finding of occult blood in the stool and even the demonstration of an irregular gastric lumen by means of the *x*-rays. The fault however, lies not only in the insufficiency of our diagnostic methods, but also in the fact that gastric cancer is essentially an insidious disease usually producing no symptoms of any consequence, until the process has advanced too far for a radical cure. Usually the carcinoma has become fairly extensive before the patient experiences any dyspeptic symptoms; another interval, with its periods of spontaneous improvement and exacerbation, elapses before he sees fit to consult a physician; the latter requires a longer or briefer period of observation, depending upon the individual case, before he can establish the diagnosis so that, when the patient is finally turned over to the surgeon, the tumor has usually had sufficient time to become inoperable.

The striking exceptions to this rule are the cases in which the cancer is located at the pylorus. Here a relatively small tumor can produce the characteristic symptom-complex of pyloric obstruction and the great majority of the gastric cancers that admit of radical operation are of this kind. What shall we do with the others? The counsel of perfection doubtless would be to subject to an exploratory laparotomy every individual over forty years of age whose gastric disturbance does not yield to treatment within four weeks. If this policy could be carried out, the proportion of gastric cancers admitting of a permanent cure would doubtless be greatly increased. In practice, however, this rule can rarely be carried out on account of the disinclination of patients to subject themselves to a serious operation, of the advisability of which they cannot be convinced. By the time a diagnosis of gastric cancer has become established with a reasonable degree of certainty, most of the cases have already become inoperable.

Shall we, nevertheless, advise operation in every clearly established case of gastric cancer in which there is no definite evidence of metastasis? I have pursued this policy for a good many years and doubtless shall con-

tinue to do so, in the hope of occasionally getting a brilliant result. But while a partial gastrectomy or, in suitable cases, a gastroenterostomy has sometimes prolonged the patient's life and added to his comfort, I must admit that often the expense and anguish of the operation have not been accompanied by compensating benefits to the patient. Leaving aside the matter of palliative operations; for which there are definite indications, the question arises whether we have any means of distinguishing, prior to operation, between those gastric cancers that offer a fair prospect of radical cure and those that do not.

In the first place, the entire group of pyloric cancers, for reasons already mentioned, should in the absence of evidence of metastases be operated upon. It is in these cases that the earliest diagnoses are made and that the bulk of permanent cures is accomplished. For cancers elsewhere in the stomach the paradoxical dictum of Boas holds good, that the longer a cancer has grown without becoming inoperable the better the prospect of a permanent cure. These cancers can conveniently be divided into two groups. The one spreads rapidly, forms metastases early and has become inoperable before it causes any definite subjective disturbance. The other, more benign, grows slowly, forms a compact tumor and remains susceptible of complete extirpation for a long period of time. This leads to a point that is better known to the surgeon than to the general practitioner, for which reason I have taken the liberty of bringing it up to-night.

It is still a prevalent opinion that non-palpable gastric cancers offer a better prospect of radical operation than those in which a distinct tumor can be felt. As a matter of fact, the reverse is more apt to be true. Gastric cancers sufficiently advanced to be diagnosed, in which no tumor can be felt either after inflation or in narcosis, are nearly always inoperable. They have usually spread laterally to a considerable extent, have led to adhesions and have invaded other viscera. Where a distinct tumor can be felt, before emaciation and cachexia have set in, there is a fair prospect of our finding a relatively benign cancer, that growing slowly has formed a hard circumscribed mass and that can be extirpated in its entirety. This will still more probably be the case if the tumor be so small that it can be felt only on inflating the stomach or after anesthetizing the patient, and, especially, if the tumor be freely movable. But even if it is fixed, it is possible that the adhesions are inflammatory rather than due to the spread of the growth and even in the latter case the entire mass occasionally admits of extirpation. Briefly, then, we may say that in cases in which the diagnosis of gastric cancer has been made and in which cachexia has not set in, we may hope for a radical extirpation:

1. When the growth is situated at the pylorus.
2. When there is a palpable tumor, especially, if the latter is very small and freely movable.

By way of illustration, I shall take the liberty of citing two cases of

non-pyloric gastric cancer in one of which the possibility of radical removal was demonstrated only at autopsy, whereas in the other a permanent cure was obtained. The first case was a man, aged 65, with a history of gastric disturbance of long standing. There was no evidence of stagnation and the gastric chemism remained normal. A movable tumor gradually made its appearance in the epigastrium but operation was refused. Chills and a septic fever set in and the patient soon after succumbed. A round tumor was found, at autopsy, near the pylorus. In the center of the tumor was a small abscess. No adhesions, metastases or cancerous glands could be found and it seems probable that a radical extirpation might have been possible up to the very last.

The second case deserves a little more detailed consideration. The patient, a man of 60 years, first consulted me on July 6th, 1905. Except for several attacks of what appeared to be gall-stone colic in 1898 he had always been well; in particular, there was no history of gastric disturbance. At the beginning of 1905 he had felt absolutely well and weighed 172 pounds. In January of that year, however, he had an attack of grippe and had been losing weight steadily ever since. It was for this loss of weight that he consulted me. Subjectively he felt absolutely well; there was no pain, no failure of appetite, no gastric disturbance excepting after gross indiscretions in diet. On one such occasion, however, he had regurgitated some coarse vegetables that he had eaten several days before. Physical examination showed nothing of significance except evidence of rapid loss of weight. His weight when first seen was 141 pounds, a loss of 31 pounds in six months. The next morning, after a heavy supper, 300 c.c. of sour content were expressed from the fasting stomach, consisting of food eaten the day before. Starch digestion was good, total acidity 60, free HCl and lactic acid absent, peptic and rennic activity normal. An hour and a half after an Ewald breakfast, 250 c.c. contents were obtained consisting of well-digested starch with a few meat fragments, total acidity 30, free HCl and lactic acid absent, ferments normal, no yeast, sarcinæ or Boas-Oppler bacilli. Inflation showed only a moderate gastropnoia. Ten days later his weight had not changed, the fasting stomach, after a light supper the day before, was empty and two hours after an Ewald breakfast nothing could be obtained. Ten days later, he had lost a pound and a half in weight, his fasting stomach was empty, but one hour after an Ewald breakfast, 300 c.c. of gastric contents were obtained with a total acidity of 25, no free HCl or lactic acid, ferments normal, microscopic examination negative. On inflating the stomach a very small mass could be felt through the flabby abdominal parietes, in the epigastrium just to the right of the median line. It was freely movable and very slightly tender. Operation was urged but refused. On August 15th (17 days later), he had again lost a pound and a half but continued to feel entirely well. The mass was now distinctly palpable, about the size of a hazel-nut, freely movable, lying just to the left of the median line, half-way between navel and

xyphoid appendix. A month later he had maintained his weight and continued to feel perfectly well. The mass had grown, being now about the size of a pigeon's egg, still freely movable. He then passed from out of my care, but I subsequently learned that he had put himself into the hands of a surgeon, who on September 25, 1905, did a partial gastrectomy, removing seven inches of the pyloric end of the stomach, the tumor being situated on the greater curvature in the pyloric portion. Some 15 inches of gut are also said to have been removed. A posterior gastro-enterostomy was done with a Murphy button, which passed 6½ months later. The gall-bladder was palpated but nothing found. At the time of the operation he is said to have weighed 124 pounds. A year later he weighed 166 pounds, ate everything and felt absolutely well. In January, 1908, I again saw him for a trifling indisposition. He weighed 152 pounds. The fasting stomach contained only a little bile-stained mucus. After an Ewald breakfast, 50 c.c. of bile-stained contents were obtained, faintly acid, no free HCl, no lactic acid. The inflated stomach had the normal outlines to the left of the median line, but ended abruptly at the operation scar in the median line, there being no gastric tympany to the right of the latter. Since then I have heard of him from time to time through other members of his family. He has continued entirely well, it being now nearly five years since the operation.

FUNCTIONAL DISORDERS OF THE BLADDER IN THE
FEMALE SIMULATING CYSTITIS.

By ARTHUR STEIN, M. D., of New York.Assistant Visiting Gynecologist to the German Hospital; Instructor in Gynecology, N. Y. Post-Graduate Medical School and Hospital.

It is no infrequent occurrence to have women, who come to the physician for some gynecological trouble, make the statement that they have bladder symptoms of some sort or other. These symptoms usually consist of frequent and painful micturition, and occasionally it is specified that the pain occurs before, during, or after emptying the bladder, or that the pains are especially marked during the menstrual period. Usually such women have already been treated by the administration of drugs or by bladder irrigations, since their physician concluded from the subjective symptoms that they had a cystitis. The more we gynecologists are on the lookout for such cases, the more we must become convinced how frequently mistakes are made along these lines and how essential it is to make a correct diagnosis.

When giving such routine treatment, the fact is overlooked that a great number of ailments situated outside the bladder can give symptoms which correspond to those of a real cystitis. This explains the failure of the treatment applied, for subjective symptoms are simply treated without getting at the real cause of the trouble.

We know by experience that the pathological conditions of the female generative organs only too frequently involve the bladder, though the bladder mucous membrane itself has not undergone any changes (that is, when there is no real cystitis). We furthermore know that changes in the independent nervous system of the bladder or changes in the general nervous system can cause the typical symptoms of a cystitis, without a true cystitis really existing. In spite of these facts the opinion still prevails, especially among general practitioners, that a cystitis must be present whenever there is a frequent desire to urinate. It may therefore be of interest to review all those conditions in the female which can cause bladder symptoms without a true cystitis being present.

Let me say right here that my remarks shall include only such cases, in which both the cystoscopic and the chemical examination has excluded a cystitis. This means that cases of cystitis colli will not be considered.

We come then to the real subject-matter of this paper. Bladder symptoms without a cystitis may be manifold. Pain before, during, or after urination, a frequent or diminished desire to urinate, tenesmus, paralysis of the bladder, a retention or incontinence on a nervous basis,

dribbling of urine with or without retention, may all be the result of pelvic disorders outside the bladder or of some systemic disease.

To make matters simpler, I shall make three subdivisions:

1. Cases in which there is some pathological change or irritation of the nerve centres in the bladder wall itself.
2. Cases in which there is some pathological change in the genital organs.
3. Cases in which we are dealing with some general nervous trouble or systemic disease.

To be able better to understand the pathological conditions mentioned under subdivision (1), I shall refer briefly to the few publications concerning the physiology and anatomy of the bladder wall itself. Only when we are fully acquainted with the anatomy and physiology of the bladder will we be in a position to understand the pathological changes.

I do not believe I am exaggerating when I say that next to Frankenhäuser's classical paper, published in 1867, the recent work of Roith and E. Kehrer, Jr., deserves the greatest attention. Roith showed in various articles on the nerve plexus of the female pelvis and the innervation of the bladder, that the nerve apparatus is to some extent independent of the central nervous system. He describes it as being situated in the compact connective-tissue layer of these organs, alongside the branches of the hypogastric, the loose connective-tissue framework being free of nerve elements. The ganglia are most numerous in the posterior and lateral portions of the cervix, while the ganglion cells of the bladder lie chiefly in front of the cervix, in the region of the trigonum. He also established the fact that when the spinal nerves are injured, the sympathetic ganglia in the pelvis take care of the innervation of the bladder. He found that when all the direct nerve tracts were cut, the sensation of a full bladder is effected: (1) through the muscle sense of those muscles of the pelvic floor which lie adjacent to the bladder; (2) through a stretching of the parietal peritoneum; (3) through the sensory fibres of the nervus pudendus communis, supplying the urethra. When the bladder is filled to a certain degree, the walls are put on the stretch, the latter affects the ganglia in the pelvic connective-tissue and in the bladder wall, and these in turn, reflexly cause a contraction of the detrusor.

Kehrer, Jr., has shown that there is a reciprocal relationship between bladder and uterus, a dilatation of the bladder reflexly producing a cessation of uterine contractions. He thus demonstrated experimentally, the well-known observation, that a very much distended bladder has a tendency to cause hemorrhage and subinvolution of the puerperal uterus. On the other hand, contractions of the bladder will increase uterine contractions and vice versa a sudden dilatation of the uterus will cause a relaxation of the bladder. So, too, contractions of the uterus, brought about by chemical or mechanical stimulants, will cause increased bladder contractions. Kehrer also proved that this reciprocal relationship be-

tween the urinary and genital organs, continues even after the pelvic and hypogastric nerves, which supply uterus and bladder, have been cut. He therefore concluded that the reflexes between the bladder and uterus are carried on by an independent nervous system in these organs.

What do these anatomical facts teach us? In the first place they draw our attention to the fact that we are dealing with an independent centre in the bladder or with bladder ganglia. Changes in this independent nerve apparatus must therefore be able to cause symptoms resembling those of a true cystitis, although the latter is actually absent. The function of these ganglia resembles that of the plexus of Auerbach and Meissner in the intestinal wall. In both organs we at times get pains, contractions and tenesmus, without even the slightest change in the mucosa. I am convinced that a great deal is still to be gained by further experimental work along the lines followed by Roith and Kehrner, Jr.

To my mind many of the so-called hysterical bladder symptoms are of neuritic origin. In this class of cases it would be absolutely wrong to carry out any local treatment of the bladder; what we should do, is to distract the patient's attention from her bladder symptoms by psychical and general treatment. A recent case of my own has demonstrated to me the logic and possibilities of the latter course. A woman, 27 years old, with a fixed retroflexion, a small ovarian cyst, and signs of general nervousness, stated of her own accord that she had to pass her urine every hour during the day and had to get up several times at night. After a careful examination I could find no changes in the bladder mucosa. Together with local treatment for her gynecological ailment I tried psychical treatment. After four weeks, the urinary symptoms had entirely disappeared, in spite of the fact that the fixed retroflexion had not been entirely relieved. By exclusion we must therefore conclude that the patient's bladder symptoms were caused by the gynecological condition, and possibly, in part, by an irritation of the nerve centres situated in the bladder wall. At any rate, any local bladder treatment would have been contraindicated. It would only have made the patient take more notice of her urinary symptoms.

Under this subdivision we must also include those cases, in which the bladder wall is irritated to such a degree by chemical changes in the urine that typical cystitis symptoms result. It is not generally known that tenesmus can be caused by the drinking of freshly-brewed beer. After a few days the symptoms disappear spontaneously or may remain if the patient continues to drink the beer. I agree with Rissmann, that in such cases the symptoms are due to some strongly irritating hop-salt. In Europe these cases are more frequent than here. I only refer to them, so as to show the importance of a chemical examination of the urine whenever we have to deal with bladder symptoms without demonstrable pathological changes. Depending upon the result of the examination we can prescribe the corresponding dietary treatment. Before going over to the second class of cases, I wish to mention a rather rare occurrence

which might resemble an inflammatory condition of the bladder, but has its origin elsewhere. I refer to those malformations of the urinary tract in which the ureter empties either into the vagina, urethra, or just below the external meatus of the urethra. As a result we get a continuous dribbling of urine, a symptom which also occurs in inflammatory conditions. If only a superficial examination of the case be made, this malformation may lead to the making of a wrong diagnosis and therefore to improper treatment.

I come now to my second subdivision—cases in which there is some pathological condition of the genital organs. A goodly number of the women, who come to the gynecologist for advice, complain of bladder symptoms which not infrequently resemble those of a cystitis. To convince myself as to how many really make such a complaint, I carefully examined the histories of 54 patients. 30, that is 55.5 per cent., made no reference to the bladder; 18, that is 33 $\frac{1}{3}$ per cent., complained of urinary symptoms, which on careful examination were found not to be due to changes in the bladder itself; and only in 6, that is 11 $\frac{1}{10}$ per cent., the symptoms were due to inflammatory conditions in the bladder. In other words, $\frac{1}{3}$ of all the women seeking advice for some gynecological trouble complain of urinary symptoms, though no real disease of the bladder is present. We may then safely conclude that the symptoms referable to the bladder in these cases are due to the gynecological ailment.

We all know that the menstrual period, a physiological and not a pathological state, can cause bladder symptoms. Very often young girls complain that they have a frequent desire to urinate at the time of their menses. Here we are simply dealing with a bladder which takes part in the general congestion occurring in the pelvic organs during menstruation. Surely the weight of the small anteфлекed virgin uterus is not the cause.

Before referring to various pathological pelvic conditions I want to emphasize that the first requisite, before making any other examination, is to analyze the pains during micturition. Pains occurring before urination and diminishing during the act, point towards a true cystitis; if they are most marked during urination, that is if the urine burns, a urethritis is the most likely diagnosis. When the pains are referred to the lower portion of the abdomen, occurring immediately after urination, and continue for some time, we may safely conclude that the peritoneum is involved. Pains of this character frequently accompany a pelvic peritonitis. Thus a patient with inflamed genital organs may have urinary symptoms similar to those of a true cystitis, while the bladder itself is absolutely normal.

To repeat then, it is necessary to analyze urinary symptoms when they exist. It will not do, simply to note in the history "increased frequency of urination" or "painful urination." Mirabeau, in a recent publication, gave an excellent classification of the various bladder symptoms. He distinguishes:

1. Pathological changes as to frequency of micturition.
2. Changes in the normal sensations during urination.
3. Disturbances as regards continence.
4. Changes in the character of the act, whether intermittent, etc.

I have already mentioned that the congestion during menstruation often causes an increased frequency of urination. The same holds true during pregnancy, except that in the later months lack of room is partly the cause of the symptoms. This brings us up to the question of the relation between pelvic tumors and bladder symptoms.

In 1674 myoma cases, Kelly and Cullen found an increased desire to urinate in 109, that is $6\frac{1}{2}$ per cent. In 20 cases there was a partial or complete retention of urine; in 7 there was partial or complete incontinence; in only 2 was there a true cystitis present. A retroflexed pregnant or non-pregnant uterus, hematoceles, ovarian cysts, and cystoceles, may all mechanically cause bladder symptoms of various kinds. Regarding cysts, the dermoids when they have ruptured into the bladder, are especially liable to lead us to believe that we are dealing with a catarrh of the bladder, for then, too, we meet with painful micturition and pus in the urine. Nowadays, with more frequent use of the cystoscope, mistakes in diagnosis should occur but seldom along these lines.

An anteponition of the uterus, and a retroflexio-versio have the same effect on the bladder as a retroflexion. By anteponition we mean a uterus which is pushed forward in front of the axis of the pelvis by some exudate, hematocele, or tumor lying behind it. The immediate result of such uterine displacements is an altered bladder function. The latter organ may be distorted or in advanced cases there may even be compression of the neck of the bladder. Frequent desire and frequent voiding of small quantities of urine are the symptoms accompanying this condition; in fact, ischuria paradoxa, that condition in which the patient has a continuous desire to urinate with constant dribbling, may result. Cystocele might also be mentioned here, for through pulling and dragging on the bladder symptoms similar to a cystitis may be caused.

I should just like to say another word regarding the influence of pelvic inflammation on the bladder. We can readily understand how purulent processes in the parametrium, especially those in front of the uterus (the so-called "plastron" of the French writers), can influence the bladder, either by pulling at it, by pressure, or by a direct extension of the inflammatory process to the perivesical tissue. So, too, a carcinoma of the uterus, which is beginning to involve the perivesical tissue, will give bladder symptoms.

All the pathological conditions mentioned so far—tumors, malpositions of the uterus, cystoceles, inflammations—cause frequent or painful urination when they do cause bladder symptoms.

When we meet with disturbances of urination referable to continence or with changes in the character of the urinary act, we are usually dealing with diseases situated outside the pelvis. This brings us to sub-

division 3, cases with some general nervous trouble or some systemic disease.

Until now I have carefully avoided the expressions, hysteria and irritable bladder, for I believe that they can nearly all be explained on some anatomical basis: that is, if they are carefully examined. A few, of course, will still have to be classified as hysteria. In no other way could the incontinence epidemic reported by Karplus in 1906 be explained. A patient with compression myelitis suffered from incontinence, in the same room with her were two girls with hysteria. One day one of the latter claimed she could not get up and began to pass her urine involuntarily; a few days later the other did the same. They remained in bed many weeks with this condition. As far as could be observed, they passed a little urine every few minutes. Finally the symptoms abated without treatment.

Granted that cases of true hysteria still occur at times, I feel certain that most bladder symptoms which are called hysterical, are in reality due to inflammatory processes in the pelvis. We have seen that the pelvic ganglia also supply the bladder to some extent. That chronic inflammatory conditions in the pelvis really affect the general nervous system is not to be denied. Concerning this my former chief in Heidelberg, v. Rosthorn, wrote: "Although the idea of a causal relationship between the general nervous system and pelvic inflammation is antiquated and denied by many, I myself cannot deny its existence when I consider the large number of nerve ganglia in the pelvic connective-tissue. The peripheral irritation, caused by a contracting scar in the pelvic connective-tissue in which the ganglia and nerves are situated, cannot be without general effect, when we consider the effect of scar contraction in other parts of the body. In addition the pelvis is rich in sympathetic nerve elements. These are in direct connection with the mass of prevertebral ganglia which are in close relation with spinal nerve endings. Is it not therefore justifiable to conclude that *certain functional neuroses have their origin in such local changes?*" He believes that the cases to be explained on this basis are limited in number and have no connection with those cases which neurologists call hysteria.

Under this subdivision we must also include those cases of so-called reflex incontinence which are caused by masturbation, by a hypertrophied clitoris, or by a thickened hymen. Operative interference cures these as a rule. Many of them, however, are still diagnosed as hysteria or even as cystitis.

Coming now to the large number of diseases of the nervous system which affect the bladder, *tabes* heads the list. Though *tabes* occurs less frequently in the female than in the male, it cannot be denied that it does occur and can cause bladder symptoms. About 50 per cent. of all the *tabes* patients have distinct bladder symptoms. As a matter of fact the latter are often among the initial symptoms of the disease. The patients complain of a frequent desire to urinate, of unpleasant sensations during

micturition, and occasionally of pollakiuria. In progressive paralyses we also have similar symptoms, that is in the form in which the knee reflexes are diminished. In the form in which they are increased the irritability of the bladder may be increased. The picture then resembles the spastic or tonic bladder. The patients cannot urinate spontaneously and occasionally tenesmus sets in. Compression myelitis, multiple sclerosis, syringomyelia, tumors of the vertebral column may all cause bladder symptoms. Of the cerebral diseases cortical lesions and those of the crossed pyramidal tracts are most likely to cause bladder disturbances. According to Oppenheim a frequent desire to urinate is no rare initial symptom in cases of cord tumor, such as tubercle, sarcoma, psammoma, endothelioma, and fibroma.

It is not generally known that morphine, even in very small doses, can cause temporary anuria. The same can happen after turpentine, aniline, and many other forms of poisoning.

This brings us to infectious diseases and their effects on the bladder. Little need be said of these, for they are usually diagnosed and properly treated, so that the secondary bladder symptoms are likewise handled properly.

After mentioning intestinal parasites, hemorrhoids, anal fissures, and constipation, all the conditions which might possibly cause bladder disturbances have been mentioned.

I trust I have made it clear that every bladder symptom, be it painful urination, frequent desire to urinate, or purulent urine, is not necessarily due to a cystitis. We have seen that a bladder disturbance may be due to various diseases and that it is often only the symptom of a most grave systemic disease.

It is not correct to use the expression "so called cystitis" in these cases, because this name suggests a pathological condition of the mucosa. Rather should all these disturbances be called "cystalgia," that is painful bladder, because this name only describes a symptom and does not pin us down to any primary disease of the bladder.

Reference to treatment has been purposely avoided. One can readily understand that it must be as varied as the diseases which cause the bladder disturbances. In short, we must diagnose and treat the cause. Only in this way can we hope to cure the bladder symptoms. The physician who still treats all bladder disturbances as a cystitis, without going to the root of the trouble, will be rewarded with but little success.

EPHRAIM McDOWELL: THE FATHER OF ABDOMINAL SURGERY.*

By GEORGE GELLHORN, M. D., of St. Louis.

We have ample reason for gratefully remembering the blessings that the year 1809 has bestowed upon posterity. It was just one hundred years ago that Charles Darwin was born and Abraham Lincoln and Mendelssohn-Bartholdy. One hundred years ago, Lamarck's "Philosophie Zoologique," the forerunner of Darwin's "Origin of Species," first appeared, and during the same year, the first edition of Goethe's "Faust" was published—at the time when, in Vienna, Beethoven was in the prime of his creative genius. While in Europe the cannon of



Fig. 1. Ephraim McDowell, at the age of 29.
(By courtesy of Dr. C. H. Wallace, St. Joseph, Mo.)

Napoleon thundered and thousands lay stretched out upon the bloody battle-fields of Spain and the Tyrol, of Aspern and of Wagram, a simple practitioner in the backwoods of Kentucky conceived, and carried out, a daring plan that was destined to save many thousands of suffering women from invalidism and from death.

Danville, Kentucky, at the present day, is but a small country town of 4,000 inhabitants, and a century ago it consisted of less than sixty houses, but it was widely known throughout Kentucky and the adjacent states as the home of Dr. Ephraim McDowell, the excellent surgeon, whom

*Read before the St. Louis Medical History Club, December 2, 1909.

people consulted from near and far, and who frequently travelled hundreds of miles on horseback in response to a professional call.

Ephraim McDowell, the son of Scotch-Irish parents, was born in one of the Southern counties of the State of Pennsylvania, November 11, 1771, when the American colonies were in the period of agitation preceding the Revolution. While still a very young child, his family migrated to Rockbridge County, Virginia. His father, Samuel McDowell, became a prominent man in that State, and eventually was made a member of the legislative assembly of Virginia. In 1782 he was sent by the legislature as a land commissioner to Kentucky, which was then a county of Virginia. A year later he was appointed judge of the district court of Kentucky



E McDowell

and removed his family to Danville, where the sittings of the court were held.

As there was no good school in Danville at that time, Ephraim was sent to the classical seminary at Georgetown, Ky. When he decided to become a physician, he went to Staunton, Va., and following the custom of that period, entered on the study of medicine in the office of Dr. Humphreys, a graduate of the University of Edinburgh. It was in all probability the influence of his preceptor that prompted him to go to Edinburgh in the year 1793, when 22 years of age. There he attended the regular lectures at the university for one or two winters. Edinburgh was then universally regarded as the most famous center of medical education in the world. One of the greatest attractions was a course of private lectures on anatomy delivered by John Bell, the most able, elo-

quent, and gifted of Scotch surgeons of his day. Bell at that time was greatly interested in the diseases of the ovary, and in his impressive manner painted in startling colors the inevitable death to which the victims of ovarian cysts were doomed. He even suggested the hope that success might attend an operation for removal.

This idea did not start originally with Bell. As is so often observed concerning new thoughts, there must have been an undercurrent in the minds of different men and in different countries as to the possibility of



Fig. 3. The first ovariectomy.

operative treatment of ovarian cysts. As early as 1757 William Hunter had suggested incision under exceptional circumstances, in place of the use of the trocar, which was then the only method used. Delaporte and Morand, in France, in 1774, discussed the possible extirpation of diseased ovaries, and in 1786 John Hunter advised removal of hydatids of the ovaries in their incipient stage. But these views were merely theoretical; and, as medical utterances in the eighteenth century did not attain the wide

publicity of our days, they were known only to a very limited circle. It may be surmised, however, that the principles and suggestions enunciated by Bell made a deep impression on the young disciple and impelled him sixteen years afterwards to attempt what was then considered an impossibility.

In 1795 McDowell returned to his home at Danville and entered on the practice of his profession. His sound preliminary education, the distinction of having been a student at the famous University of Edinburgh,



Fig. 4. Another version of the first ovariectomy.
(By courtesy of Dr. C. H. Wallace, St. Joseph, Mo.)



Fig. 5. A mob gathered about McDowell's house threatening his life if the operation should prove fatal to the patient.
(By courtesy of Dr. C. H. Wallace.)

his own skill, his indefatigable zeal, the kindness of his character—all these factors concurred to make him surpass his colleagues and to widen the sphere of his professional activity. He was in the habit of performing every surgical operation then practised. He had the reputation of being extremely successful in lithotomy, as well as in strangulated hernia. He did successfully various amputations and other operations, including tracheotomy. He stood so high in surgery west of the Alleghanies that, in 1807, the Medical Society of Philadelphia, at the time the most dis-

tinguished of its kind in this country, sent him its diploma without any solicitation on his part.

Two years later he was to perform the culminating feat of his life, that exploit which made him immortal. In December, 1809, he was called to see a Mrs. Crawford, who, for several months, had thought herself pregnant. She was afflicted with pains similar to labor pains, from which she could find no relief. So strong was the presumption of her being in the last stage of pregnancy that two physicians who were consulted about her case, requested McDowell's aid in delivering her. He thus describes this case: "The abdomen was considerably enlarged, and had the ap-

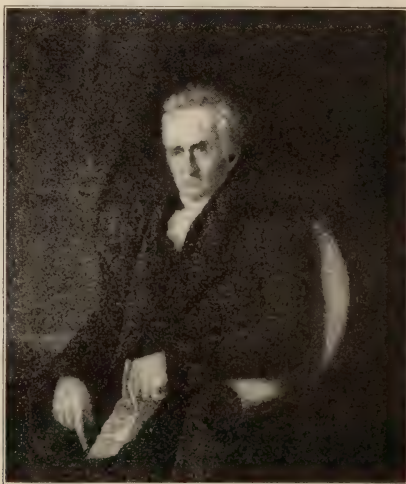


Fig. 6. Dr. Nathan Smith, the second ovariectomist in America.
(By courtesy of Dr. James Moore Ball, of St. Louis.)

pearance of pregnancy, though the inclination of the tumor was to one side, admitting of an easy removal to the other. Upon examination *per vaginam*, I found nothing in the uterus, which induced the conclusion that it must be an enlarged ovary. Having never seen so large a substance extracted, nor heard of an attempt, or success attending any operation such as this required, I gave to the unhappy woman information of her dangerous situation. She appeared willing to undergo an experiment which I proposed to perform if she would come to Danville, a distance of sixty miles from her place of residence. This appeared almost impracticable by any, even the most favorable conveyance, though

she performed the journey in a few days on horseback. With the assistance of my nephew and colleague, James McDowell, M. D., I commenced the operation which was concluded as follows: Having placed her on a table of ordinary height, on her back, and removed all her dressings which might in any way impede the operation, I made an incision about three inches from the musculus rectus abdominis, on the left side, continuing the same nine inches in length, parallel with the fibers of the above-named muscle extending into the cavity of the abdomen, the parietes of which were a good deal contused which we ascribe to the resting of the tumor on the horn of the saddle during the journey. The tumor then appeared full in view, but was so large that we could not



Fig. 7. Monument to McDowell erected in Danville by the Kentucky State Medical Society.

take it away entire. We put a strong ligature around the Fallopian tube near to the uterus; we then cut open the tumor, which was the ovarium and fimbrious part of the Fallopian tube very much enlarged. We took out fifteen pounds of dirty, gelatinous-looking substance; after which we cut through the Fallopian tube and extracted the sac which weighed seven pounds and a half. As soon as the external opening was made, the intestines rushed out upon the table, and so completely was the abdomen filled by the tumor, that they could not be replaced during the operation, which was terminated in about twenty-five minutes. We then turned her upon her left side so as to permit the blood to escape, after which we closed the external opening with the interrupted suture, leaving out at the lower end of the incision the ligature which surrounded the Fallopian tube. Between every two stitches we put a strip of adhesive

plaster, which, by keeping the parts in contact, hastened the healing of the incision. We then applied the usual dressing, put her to bed, and prescribed a strict observance of the antiphlogistic regimen. In five days I visited her, and much to my astonishment found her engaged in making up her bed. I gave her particular caution for the future, and in twenty-five days she returned home as she came, in good health, which she continues to enjoy."

From a later note we learn that Mrs. Crawford lived till March, 1841, a period of thirty years, when she died in the seventy-ninth year of her age. All glory to the stout-hearted woman who submitted to this experiment in the face of such terrible suffering and jeopardy.

A pious legend has depicted the operator fearlessly doing his work while a mob gathered about the house threatening his life if the unheard-of reckless experiment should prove fatal to the patient. Dr. Lewis S.

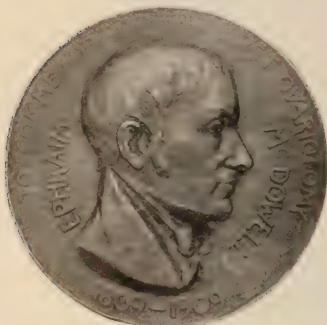


Fig. 8.



Fig. 9.

Figs. 8 and 9. Obverse and reverse of a medal struck by the American Gynecological Society.

McMurtry, of Louisville, who was born and raised near Danville, and who has known personally several of McDowell's contemporaries, discredits this story in a recent and eloquent sketch of the life of Ephraim McDowell (*New York Med. Journ.*, May 8, 1909). If we remember the social position of the McDowell family and his personal prominence and popularity, we must needs agree with McMurtry's arguments.

Nor does it need fiction to make us value justly the boldness of the new venture. J. Riddle Goffe, whose beautiful and inspiring tribute to McDowell (*Amer. Journ. of Obstet.*, Vol. LIX., No. 5, 1909) has been extensively quoted in this paper, points out that the courage required to meet the novel emergency can best be appreciated when we reflect that anesthesia was unknown; that hypodermic needles for administration of

stimulants or morphine had not yet been invented; that saline injections for relief of shock were still in the future; that the operator had no skilled assistant to aid in the work, and that the trained nurse was as yet untrained. Fortunately for the operator's steadiness of nerve, sepsis and antisepsis were not to be reckoned with, for they, too, were unknown. So he had no qualms of conscience on that score.

The world at large knew nothing for a long time of the wonderful deed of this man at once so simple-hearted and so great, for not until seven years later, in 1816, after he had performed two other successful ovariectomies, did McDowell publish his cases in a Philadelphia medical journal, called *The Eclectic Repertory and Analytic Review*. Can it cause us any surprise that the report of a utopian idea which all of a sudden had become a bare fact, found at first an incredulous audience? Thus was Copernicus received, thus was Galileo oppressed, thus was Benjamin Franklin ridiculed, thus was Semmelweis ignored. In the case of McDowell, the omission in his report of certain details of environment, preparation, and after-treatment seemed to invite unfavorable criticism.

But Truth can never be suppressed. Not only did McDowell himself perform in all twelve ovariectomies, seven of which were successful, but others, uninfluenced by scathing skepticism, followed in the footsteps of the master. Emiliani, in Italy (quoted from R. Kossmann, *Allgemeine Gynaekologie*, Berlin, 1903, p. 221) seems to have been the second ovariectomist in the world. In 1815, he successfully removed a small ovarian tumor in spite of adhesions with the colon. Then came Chrystar, in Germany (quoted from Kossmann, *ibid.*) who, in 1819 and 1820, performed three ovariectomies with two deaths from peritonitis. In 1821, Nathan Smith, of New Haven, Conn., added to ovariectomy two important improvements: he made a short incision of only 3 inches, tapped the cyst with the trocar before pulling the sac outside the wound, and dropped the pedicle, which was ligated with narrow strips cut from a kid glove, into the abdominal cavity. His patient recovered completely.

It was not until 1824 that the first ovariectomy was attempted in England by Lizars, who, however, had mistaken a phantom tumor for an ovarian cyst. Two years later, he operated on three other patients, but his results did not compare well with those of the American surgeons. In the fourth decade of the last century, Clay and Bird, in England, and the brothers John and W. L. Atlee, as well as Peaslee, in this country, performed a number of successful operations. W. L. Atlee was the originator of vaginal ovariectomy in 1857. In France, Woyekowsky performed the first ovariectomy in 1844 (quoted from Kossmann, *l. c.*); his patient conceived four months later. Yet, so intense was the opposition of the medical public against this startling innovation and so great the disinclination of many surgeons of renown to take on themselves the risk of performing so dangerous an operation, that Kiwisch, in 1849, found only 86 cases of complete ovariectomies, with 47 deaths, recorded in the

literature of the world. The discovery of narcosis and the introduction of antiseptics and asepsis removed all possible objections to the operation, and ovariectomy has now been done in numberless cases with a mortality, which, in uncomplicated cases, is practically *nil*.

McDowell did not live long enough to see clearly the triumphal march that his operation was to take through all the nations of the world. He died on January 23, 1830, in the fifty-ninth year of his age. But he did have the satisfaction of the fact that the editor of the *Medico-Chirurgical Review*, the most influential medical British journal of that time, who had previously expressed his doubts of the veracity of McDowell's claims, completely retracted all former adverse criticisms and solemnly declared that "there were circumstances in the narratives of the first three cases that caused misgivings in our minds, for which uncharitableness we ask pardon of God and Dr. McDowell, of Danville."

It pleases our sense of justice to know that, in 1823, entirely unsolicited on his part, the University of Maryland conferred on him the honorary degree of M. D. Nor did posterity forget her indebtedness. On May 14, 1879, the Kentucky State Medical Society erected over the grave of McDowell, at Danville, a monument to perpetuate his name and fame. On April 22, 1909, the American Gynecological Society convened in New York in commemoration of McDowell's great achievement. At this meeting, the president, Dr. J. Riddle Goffe, and Dr. Lewis S. McMurtry, paid eloquent tributes to the keen surgical instincts and the courage of the man who dared; while Prof. Hofmeier, of Germany, Dr. Herbert Spencer, of England, and Pozzi, of France, spoke of the struggles of McDowell's early followers in their respective mother countries, who, in the face of fierce opposition, and even persecution, steadfastly clung to their convictions and handed down to us an operation which now is more complete in itself than any other surgical procedure. For this meeting, a beautiful bronze medal was struck, which I take pleasure in exhibiting to you.

But this meeting and this medal are not the only tribute that are paid to the memory of a great benefactor of mankind. Whenever a surgeon, at the present day, successfully removes an ovarian tumor he celebrates unconsciously that courageous deed in the low log cabin in Kentucky. Every time a patient is saved from death or lasting illness by an ovariectomy she, by her gratitude, solemnizes the manes of McDowell; and the sum total of all the life and health saved and happiness restored on the part of the patient, and all success achieved by the physician flows together in a mighty, never-ending wave to represent a "*monumentum aere perennius*."

MEDICAL AND SURGICAL PROGRESS.

THE ARSENIC TREATMENT OF SYPHILIS AND ALLIED DISORDERS.

A REVIEW OF RECENT LITERATURE.

By ALBERT E. TAUSSIG, M. D.

1. CHEMOTHERAPY IN INFECTIOUS DISEASES.—Ehrlich (*Berl. klin. Wochenschr.*, 1907, Nos. 9-12).
2. CHEMOTHERAPY OF INFECTIOUS DISEASES.—Ehrlich (*Zeitschr. f. aertzl. Vortbildung*, 1909, No. 23).
3. EFFECT OF THE NEW ARSENIC PREPARATION (No. 606) IN RELAPSING FEVER.—Iversen (*Muench. med. Wochenschr.*, 1910, No. 15).
4. THE NEWEST EHRLICH-HATA PREPARATION AGAINST SYPHILIS.—Alt (*Muench. med. Wochenschr.*, 1910, No. 11).
5. CHEMOTHERAPY OF THE SPIRILLOSES.—Hata (*Muench. med. Wochenschr.*, 1910, No. 18, p. 981).
6. TOXICITY OF SOAMIN.—Anon. (*J'l. Am. Med. Ass.*, April 16, 1910).
7. TOXICITY OF ARSACETIN.—Anon. (*J'l. Am. Med. Ass.*, May 7, 1910).
8. ARSACETIN AND ITS EFFECT UPON THE OPTIC NERVE.—Hammes (*Deutsch. med. Wochenschr.*, 1910, No. 6).
9. TREATMENT AND CLINICAL HISTORY OF EARLY SYPHILIS.—Coates (*Brit. Med. J'l.*, May 7, 1910).
10. COMBINED MERCURIAL AND ARYLARSONATE TREATMENT OF EARLY SYPHILIS.—Lambkin (*Lancet*, January 1, 1910).
11. ACTION OF EHRLICH'S SUBSTANCE NO. 606, ON SPIROCHAETE PERTENUIS IN ANIMALS.—Nichols (*J'l. Am. Med. Ass.*, July 16, 1910).

Infectious diseases may in general be divided into two groups. For the first group, that due to bacteria, we either possess specific antitoxic or bactericidal sera or there is reason to hope that the near future will provide us with them. For the other group, due to protozoa and including in man syphilis, malaria, relapsing fever, sleeping sickness and perhaps pseudoleukemia, such a prospect seems not destined to be realized. These protozoan infections seem not to produce antitoxins, at any rate not in such a form that they can be utilized as curative sera. Nevertheless, in these disorders also a true specific treatment is possible, as shown by the success of quinine in malaria and of mercury and the iodides in syphilis. But whereas the sera used in bacterial infections are

truly specific in that they are harmless to the body-cells in any dose, and attack only the bacterial agents or their products, the chemicals used in the specific treatment of protozoan disorders are true poisons, attacking the cells of the host as well as the parasite.

Hitherto little or nothing has been known about the mode of action of these chemical specifics, but of late the researches of Ehrlich and his pupils have thrown a flood of light upon this subject. Most of their work has been done with typanosome and spirillum infections in animals and, from these results, very cautious inferences have been drawn as to the treatment of similar infections in man. A vast number of compounds have been investigated, but the only ones found worthy of more careful study have been a variety of arsenic compounds and certain stains such as trypan red, pyronin and the like.

Ehrlich's first discovery was that a close resemblance exists between the mode of action of the specific antibodies in bacterial infections and the chemical specifics, especially arsenic, in protozoan diseases. The bactericidal sera, for instance, are effective because the bacteria for which they are specific have molecular groups which act like grappling-hooks, attaching the serum molecules firmly to the bacterial protoplasm. When so fastened to the protoplasm of the bacteria, the serum is able, by means of the so-called complement, to destroy the bacteria and thus may be said to be poisonous to these micro-organisms. The specific sera are absolutely harmless to the body-cells, if only because the latter have not the power of attaching these antitoxic or bactericidal molecules to themselves.

A similar condition exists with regard to the various chemical specifics, especially arsenic. The protoplasm of the various infectious protozoa, such as the malarial parasite, the spirochaete of syphilis, the spirillum of relapsing fever and the like, have the power of grappling the arsenious acid molecule to themselves and are thereby destroyed. But unfortunately the body-cells have the same power and it is for this reason that arsenic is not only a curative agent but a systemic poison or, as Ehrlich puts it, "arsenic is not only parasitotropic but also organotropic." He found, however, that various arsenic compounds differ considerably in their relative degree of organotropy and parasitotropy and the ultimate aim of all of his work has been to find some arsenious compound in which the poisonous action upon the body-cells is insignificant compared with its power to destroy the infectious agent.

The methods by which Ehrlich investigated the curative action of the various arsenic compounds are of great interest but do not admit of discussion in a brief summary such as this. Suffice it to say that the most satisfactory results were obtained by members of a group of very complex organic compounds of arsenic, called the phenylarsinates, including arsacetin, arsenophenylglycin and especially two extremely complex substances which for reasons of brevity he names Nos. 606 and 599. These two last are so extremely toxic to the infecting parasite and so entirely harmless to its host, that with them he and his associate, Hata, have been able to use with uniform success what he calls the *therapia magna sterilisans*. This "great sterilizing therapy" consists in the immediate and complete cure of an infection by means of a single injection of medicine and unquestionably forms the ideal of drug treatment. Thus Hata has uniformly cured mice infected with the spirillum of relapsing fever and rabbits inoculated with the spirochaete of syphilis by means of single injections of various phenylarsinates, while Nichols at the Rocke-

feller Institute, has been uniformly successful in curing, by means of a single injection of No. 606, rabbits inoculated with the micro-organism of sprue, the so-called spirochaete pertenuis. Ehrlich and his assistants are still hard at work at this problem, trying new arsenic compounds on various protozoan infections in a great variety of animals, in the attempt to discover substances that combine the greatest curative with the least poisonous action. He protests against any undue haste in applying the results obtained by animal experiment to man. Before advising the general use of any of his arsenic compounds, he demands that they fulfill the following requirements:

1. The therapeutic dose in animals must lie far beneath the toxic dose.
2. The drug must be uniformly successful in a great variety of animals inoculated with a great variety of strains of the infectious micro-organism.
3. The maximum dose for human beings must be established, a difficult matter.
4. The occurrence of idiosyncracies against the drug must be taken into account.
5. Careful clinical experimentation on a large number of patients by competent observers must precede the general use of the drug.

The first arsenic compounds to be used extensively in human protozoan infections, especially in syphilis and in sleeping sickness, were atoxyl and later arsacetin. The first reports of their use were extremely favorable, the later ones less so. Thus, if injected in obstinate cases of syphilis that have resisted both mercury and the iodides, they often produce an amelioration of the lesions. Their effect, however, seems less permanent than that of the older methods of treatment. In sleeping sickness, atoxyl usually causes a rapid disappearance of the parasites from the blood and a great improvement in the symptoms, often amounting to an apparent cure. Invariably, however, a relapse occurs, though sometimes only after an interval of years and the patient eventually succumbs. No case of permanent cure of sleeping sickness has as yet been demonstrated. Nevertheless, the utility of these phenylarsinates would be beyond dispute, were it not for the fact that occasionally partial or complete blindness follows their use.

For a detailed account of a remarkable series of cases of amblyopia and blindness, following the use of atoxyl and arsacetin, reference should be made to the *Bulletin of the Sleeping Sickness Bureau* (No. 8, 1909). In this, Professor Max Beck notes that Watermann treated four cases of tabetic optic atrophy with atoxyl and in each case the vision became markedly worse. He also describes 23 cases of complete and 7 cases of partial blindness out of 1,633 patients treated with atoxyl at Sesse by the members of Koch's expedition. Two series of cases treated by Gray with atoxyl are also recorded. In the first 1,135 cases, 47 had alterations of vision and 20 became totally blind. In the second series of 1,712 cases, 70 had dimness of vision and 10 became totally blind; in 2 of the latter, mercury was given with atoxyl. Dr. Paderstein has published 12 cases treated with atoxyl and 2 with arsacetin, all followed by amblyopia varying in severity from actual blindness to marked contraction of the field of vision. Paderstein's patients were Europeans; those of Beck and Gray were natives of Uganda. Ruete, Iversen, Paderstein, Hammes and others report optic atrophy following the use of arsacetin.

On the other hand many others have employed the phenylarsinate salts without any ill effects and with conspicuous advantage. In the same article from which the above is quoted, Major Ward is reported to have given 18,000 grains of soamin (a slightly modified atoxyl) to more than

100 syphilitic patients during the last two years without any ill-effects. Col. Lambkin, a zealous worker in this field, has treated 308 cases with phenylarsinates without any bad effect. During 1909, he gave over 2,000 intramuscular injections of soamin and arsacetin with no ill consequence and he attributes the toxic symptoms, that have been described, to the liability to decomposition that occurs when these salts are kept in solution. Beck, however, regards the eye symptoms as due to chronic poisoning dependent on idiosyncrasy, as many patients receiving larger quantities of similarly prepared phenylarsinates escape eye symptoms.

Col. Lambkin is the pioneer in treating early syphilis intramuscularly with the phenylarsinates in combination with mercury. He reports a series of 30 cases treated by him with injections of an atoxylate of mercury prepared for him by Greef, of Charlottenburg. He gives about 9 grains in all, divided into 8 injections administered at intervals of from 3 to 7 days. He reports remarkably good results and in no case observed any toxic symptoms. Similar reports come from Lessar and from Coates.

Nevertheless, in view of the occasional occurrence of an idiosyncrasy, producing sudden and permanent blindness, it seems to us that the use of the phenylarsinates, including atoxyl, soamin and arsacetin, should be discontinued, unless indeed some method can be devised by which the existence of such an idiosyncrasy can be determined before the treatment is begun. Ehrlich suggests that an individual hypersensitiveness may be tested by means of conjunctival or cutaneous vaccination, but the utility of this method still lacks definite proof. The phenylarsinates are the less indispensable since, thanks to the labors of Ehrlich and of his collaborators, Berthelm and Hata, we possess a series of arsenic compounds, superior to them in curative power and of far less toxicity.

Within the last few months, results that can only be called extraordinary have been obtained, in relapsing fever and in syphilis, by the use of one of Ehrlich's arsenic compounds, the one called No. 606. This is a dichlorhydrat-dioxy-diamido-arsenobenzol, a light yellow powder, which can be kept if sealed in vacuum tubes, and which must, immediately before using, be converted into the less stable sodium salt. A supply of this preparation was sent by Prof. Ehrlich to Prof. Iversen, of St. Petersburg, for clinical use. Iversen used it in 52 cases of relapsing fever. Of these, 37 received an injection during the first attack, 11 during the first relapse; these cases received the drug by means of deep injection into the buttocks. In 4 cases, treated during the first attack, the medicine was given intravenously. In all of these 52 cases, there was a critical fall of temperature and a complete disappearance of the spirilla of Obermeyer from the blood after a single injection. When injected intramuscularly there was some local pain and infiltration, which could be completely avoided by the intravenous injection. In no case was there any tendency to collapse nor any other untoward complication. In 92 per cent. of the cases, a single injection brought about a complete and permanent cure. In only 4 cases did a relapse occur, but in 3 of them the relapse was unusually mild. There is reason to believe that these 4 relapses were due to the fact that the patients did not receive the injection at the most propitious stage of the disease and that in the future even this small percentage of failures may be avoided.

For the purpose of testing the action of this arsenic preparation in syphilis, Ehrlich sent a supply of No. 606 to Prof. Alt, of Uchtspringe. The latter gave a single injection of 5 grains to each of 23 patients, mostly paretics. Eighteen of these had a positive Wassermann reaction. In 2 of them the reaction disappeared, in 2 the injection produced a marked and

in 3 a moderate diminution of the reaction. In no case were there any ill after-effects. Encouraged by these results, Schreiber, of Magdeburg, used the drug in 27 cases of florid syphilis. He reports that he has never seen such astonishing therapeutic results. Even cases that had previously been most obstinate yielded promptly. The chancres showed marked evidence of healing a few days after the injection, the induration disappearing completely; the maculo-papulous eruptions, often of a wet or ulcerative character, healed rapidly with the formation of flat pigmented spots; ulcerations on the labia healed smoothly in a few days; wide, prominent papules at the anus and in the vagina always disappeared quickly, even in a number of exceptionally severe cases. A large, obstinate, tertiary ulcer on the leg healed over completely within three weeks after the injection. The most rapid cures were obtained in a considerable number of syphilitic anginas, with dirty white patches. These lesions, usually so obstinate vanished within a few days. In all of these cases a single injection of No. 606 was given and, as the improvement dates from the time of injection and all other treatment was discontinued, the specific therapeutic effect of the drug seems indisputable.

Equally striking results were reported by Hata at the last Congress for Internal Medicine at Wiesbaden. These may have been in part based upon Schreiber's results. Hata reports 100 cases of fresh and old syphilis treated by means of single injections of preparation No. 606. In none of them were there symptoms of intoxication, excepting twice a moderate drug-exanthem. The syphilitic eruption, while occasionally showing a brief exacerbation, rapidly faded away in all cases. In 23 out of 25 cases, the Wassermann reaction disappeared.

No reports have as yet been issued regarding the value of this preparation in the treatment of sleeping sickness, but in view of the wonderful results obtained in experimental trypanosomiasis, there is every reason to hope that a cure for this dread, and hitherto intractable, disease has been found.

The situation as regards the arsenic treatment of syphilis may be summed up in a few words. The older preparations, atoxyl, soamin and arsacetin, on account of the uncertainty of their action and the ever-present danger of their causing sudden and permanent blindness, should no longer be used. The newer preparations, especially No. 606, both on the basis of animal experiment and clinical observation, promise much. Whether they, too, will occasionally have ill after-effects can only be determined after the drug has been tried on a great number of cases. Similarly, it is still too early to state positively whether a single injection results in a permanent cure of syphilis or whether the treatment must be repeated from time to time. At all events, the method is not ripe for general use; it must first be tested by means of careful work in well-equipped clinics and hospitals. Nevertheless, it is certain that we are witnessing a great step forward in the specific treatment of syphilis and allied infections and it seems probable that in the near future we shall have at our disposal a safe, rapid, and certain cure for these disorders.

APPENDICOSTOMY AND CECOSTOMY.

A REVIEW OF RECENT LITERATURE.

By MALVERN B. CLOPTON, M. D.

1. SOME OBSERVATIONS ON THE USE OF THE OPERATION OF APPENDICOSTOMY.—Barry and Whitmore (*Indian Med. Gazette*, June, 1908).
2. THE TREATMENT OF AMEBIC DYSENTERY, ESPECIALLY BY APPENDICOSTOMY.—Anders and Rodman (*Jour. A. M. A.*, Vol. liv., No. 7).
3. CECOSTOMY AND APPENDICOSTOMY.—Reed (*Jour. A. M. A.*, Vol. liv., No. 10).
4. TO PRESERVE THE APPENDIX VERMIFORMIS. ITS VALUE IN THE SURGICAL TREATMENT OF CONSTIPATION.—Keetley (Paper before Royal Society of Medicine, November 10, 1908).
5. APPENDICOSTOMY IN DIFFUSE SEPTIC PERITONITIS.—Billington (*Brit. Med. Jour.*, 1909, January 9).
6. APPENDICOSTOMY IN CONDITIONS OF ACUTE PERITONITIS.—Groves (*Annals of Surgery*, Vol. 50, No. 6).
7. APPENDICOSTOMY IN PERNICIOUS ANEMIA.—Burch (*Jour. A. M. A.*, Vol. 52, No. 11).
8. A NEW METHOD OF APPENDICOSTOMY.—Pettyjohn (*Jour. A. M. A.*, Vol. 54, No. 11).

Since Robert Weir, in 1902, introduced the operation of appendicostomy for use in such cases where it was necessary to make direct application of remedies to the diseased cecum or colon, the operation has attained a considerable range of application and is used as an adjunct of medical treatment in several very important disease conditions. Considering the fact that attempts to medicate the colon locally by way of the rectum are painful, tedious, and often unsatisfactory, and that medication by mouth is usually uncertain, this operation is one of necessity at times. Its application has been most frequent in the tropics where amebic dysentery or other forms of diarrhea are often seen and the first reports showed that the efficacy of this operation was most appreciated in climates where the diseases were most frequently encountered. Since then the field for application of irrigation to the colon has been very much enlarged, and now we find either appendicostomy or cecostomy used in semi-tropical and temperate zones. The operation has not met with great favor on the continent but practically all the experiences have been in English-speaking countries.

In the Rangoon Hospital (1), for several years, appendicostomy has been used to handle chronic ulcerated processes of the large bowel where little result has followed the internal medication. Under local anesthesia a small wound was made in the abdomen and with very little difficulty the appendix was picked up; in those cases where the appendix was not easily found, salt solution was poured into the abdomen which made the

appendix float up into the wound. After tying off the mesentery, the appendix was fixed in place with a catheter inserted. In 10 cases of chronic dysentery, 6 were cured. Four cases of severe dysentery with acute exacerbations, died despite the operation. In practically all of the cases the number of stools were decreased and the pain was much less. In one case there was a severe hemorrhage after introduction of an astringent solution; otherwise there were no unfortunate complications.

Heiser (2) asserts that amebic dysentery easily retained first place as the white man's worst enemy in the tropics, as more than one-half of all deaths and disabilities among the whites in the Philippine Islands are ascribable to this disease. But the disease may be acquired in the temperate zones. Tuttle has shown many cases amongst those who have never been outside New York, and Boggs' last report from Maryland shows 182 cases acquired in the United States. The situation of the lesions has been variously stated. Fitcher, in 116 cases examined post-mortem, rarely if ever, found lesions in the rectum and sigmoid. Tuttle, on the other hand, in 74 cases of amebic dysentery among living subjects, observed typical ulcers of the rectum and sigmoid in 70 instances. Wooley and Musgrave in 200 cases found the entire large intestine involved in 159, the cecum and the ascending colon in 23, the transverse colon only in 2, the descending colon, sigmoid flexure and rectum in 9 cases; the appendix was implicated in 14 cases and the ilium in 7.

It will then be understood, after considering these figures, why all cases of chronic amebic dysentery do not yield to rectal lavage. It is in these instances that appendicostomy offers a real sphere of usefulness. Anders and Rodman, in their work have used McBurney's gridiron incision, leaving the meso-appendix intact to prevent gangrene of the appendix. The colon is drawn well up into the abdominal wound and in this way intestinal obstruction is prevented. Later on, after 48 hours, the tip of the appendix is cut off and a No. 10 rubber catheter introduced into the cecum and irrigation of the bowel begun. They believe that it is possible to tell whether the appendix is patent and do not believe it is necessary to introduce the catheter at the time of the first operation. Even in small appendices the calibre is sufficient to admit a very large catheter. They think that cecostomy is more or less unsatisfactory on account of the difficulty, almost impossibility, of preventing leakage, resulting in the excoriation of the skin. If cecostomy is done, Gibson's operation should be used, which is practically the Stamm-Kader, and is generally preferred in gastro-enterostomy and colocolostomies. They have been surprised to find no leakage whatever from the appendix when the catheter is withdrawn. If the operation is performed for the relief of amebic dysentery, the fistula should, as a rule, be maintained indefinitely. To close the fistula, a Paquelin cautery or nitric acid should be used.

Bates, of Nashville, in a discussion before the Tennessee Association, reports on 12 patients treated for amebic dysentery by appendicostomy, of which 6 died, 3 patients were lost sight of, and 3 left the hospital with recurrent dysentery. He followed the operation by irrigation with normal salt solution and quinine injections from 1-3000 to 1-5000 strength. His results differ from most other men in the high operative mortality.

Reed (3) prefers cecostomy to appendicostomy because the proximity of the presenting pouch of the cecum to the parietal peritoneum permits of its fixation to the operation wound practically *in situ naturalis*. It can be utilized either for a small opening or large one, as may be indicated;

it permits an opening through which a catheter may be passed at any time through the valvula coli into the small intestine; it is free from undue tension as to fixation, thus avoiding the possibility of breaking up the anchorage prematurely, or causing painful lesions following the operation; and if properly managed is no more liable to be a source of fecal extravasation or an avenue of bacterial infection than is the appendix. On the other hand, the remoteness of the appendiceal base makes its fixation not infrequently a source of painful tension, which, with the pressure upon its walls of the catheter, causes the old appendix to perish. As a matter of fact, the majority of appendices do perish within a few days after operation, leaving the remaining condition one of cecostomy with an opening at an undesirable point. The adhesions resulting from appendiceal implantation are frequently very painful, owing to the constant traction. In Reed's article, after considering the usefulness of the operation in amebic dysentery, he proceeds with other indications for its use. In chronic catarrhal or mucous colitis, he believes those cases that have defied other treatment uniformly yield to colonic lavage when kept up through the cecum for periods varying from several weeks to several months. Some of the most satisfactory results have been realized in cases in which large mucous casts were shed and in which, on examination by the sigmoidoscope, the whole surface of the descending colon and sigmoid seemed to be granular. He has operated on 4 cases, with 3 cures.

Constipation, especially of the chronic type and not complicated with enteroptosis, has yielded excellent results to colonic lavage through cecal irrigation. He reports a case, where there was fecal impaction and frequently an interval of 12 days between defecations, in which the sigmoid was loaded and there were symptoms of obstruction. The cecum was opened and a laxative solution of an ounce of magnesium sulphate to a gallon of water was introduced. This was slowly infused at intervals of every 6 hours. At the end of the second day the colon was completely unloaded; after that a daily salt solution flushing acted as a stimulus to provoke bowel action. After 7 weeks the fistula closed spontaneously, and the patient remains well.

Reed has had occasion during an operation of ruptured pus tube with peritonitis to open the cecum and introduce a large amount of very hot salt solution into the bowel which promptly produced a reaction and the colon was thoroughly washed out. Later on salt solution was introduced through the cecal tube by the drop method. He believes that this method permits the application of heat where most needed, washes out the colon and its toxins, and introduces fluids where they cannot be expelled and can be easily absorbed. It also permits of nourishment of the patient and makes possible the catheterization of the small intestine through the valvula coli and consequent flushing of the upper bowel when necessary.

Following the suggestion of Clubbe, of Melbourne, he believes that cecostomy in the intussusception not only available as a cure of an existing intussusception, but also valuable in the prevention of further trouble. Another interesting observation by Reed was in a case where there was much disturbance of metabolism; on operation it was found that the intestinal flora of the cecum was very deficient. By the introduction of bacillus lactis aerogenes, bacillus bulgaricus and the streptococcus lacticus the disturbance in the bowel ceased, constipation was overcome and the general metabolism much improved.

Keetley (4) has had experience with 34 cases of appendicostomy. Most of them were for dysentery or colitis, but he is also of the opinion

that this operation is of great value in chronic constipation not yielding to ordinary methods. The colon is flushed daily with a weak solution of Glauber's salts or cascara.

The original suggestion for the use of appendicostomy in diffuse septic peritonitis comes from Billington (5). He believed that by this means one was better able to carry out Murphy's suggestion of flooding the circulation with fluids through the absorption of the large bowel. It was also possible with little pain and discomfort and much greater ease to flush the large bowel, giving after the initial large flushing as much as 12 litres of fluid in 24 hours. His results were very satisfactory.

Groves (6) finds appendicostomy exceedingly useful in conditions of acute peritonitis, especially when this has been caused by appendicitis and in children, because they do not always tolerate the tube in the rectum. He believes the main value of appendicostomy in acute peritonitis is rather as a means of combating shock and toxemia than for nutritional purposes. He reports 4 cases, 3 in children. The first one made a good recovery from the peritonitis, but died from pulmonary embolus; the next two cases in children both recovered. In each instance there was a diffuse peritonitis with intense intoxication. He makes the suggestion that in these cases of appendicitis with septic peritonitis that it is best first to open on the left side and if no pus is found this wound can be closed and the regulation opening made on the right side. If the appendix is sloughed, as it was in these two cases, a tube can be tied into the cecum through the base of the appendix. The fourth case, an adult, died with peritonitis following acute gangrenous appendicitis. He recommends that the appendix be freed to its cecal junction and, after fixation by two stitches which pass through its outer coats and the parietal peritoneum, it is cut off about a quarter of an inch from the cecum. These stitches are then passed through the skin and tied and are left long to fix the stoma readily for the introduction of the irrigating catheter at any future time. He prefers this method to tying in a tube.

Following the suggestion of Herter (7), who asserts that anaerobic bacteria in the intestinal tract play a prominent part in the etiology of pernicious anemia, the practice of rectal and colonic lavage has come to play a very important part in the treatment of this disease as an adjunct to arsenic and other medication. Burch has in one instance used appendicostomy to treat a case of pernicious anemia. A few years before Houghton had reported a case where he had used cecostomy as a means for colonic lavage with very marked improvement. In Burch's case, which was growing progressively worse under routine treatment for this disease, an appendicostomy was done, and twice daily the colon was flushed with a quart of salt solution. Ten days after the operation, improvement was noted in the blood, the convalescence progressed, the red cells increasing from 1,710,000 to 3,860,000, and the hemoglobin from 50 to 66 per cent. in 6 months. It is interesting to note that before operation, 95 per cent. of the bacteria in the stools were anaerobic, the bacillus capsulatus *aërogenes* preponderating. Ten days later 40 per cent., a month later, 20 per cent., were anaerobic and 4 months later the anaerobic bacteria were present only in normal quantities. The large amount of ethereal sulphates, indican and skatol, found in the urine before operation are now only in normal quantities. He recommends that in all cases of pernicious anemia the stools should be examined in order to determine the presence of bacillus capsulatus *aërogenes*. If these bacteria are present in great quantities then high irrigation, combined with arsenic

internally should be used, and if the patient fails to improve then the appendix offers the best route for thorough irrigation.

Pettyjohn (8) in 3 cases has used what he considers an original method of appendicostomy. A longitudinal incision is made along the outer border of the rectus muscle; the fingers are introduced into the abdomen to determine the point of origin of the appendix. Over this point a vertical stab-wound is made through the abdominal wall, using a small knife. The appendix is grasped by narrow forceps and thrust through the stab-incision, the cecum is drawn tight to the parietal wall. The large wound is then closed, the appendix is immediately opened and the catheter inserted. The quinine irrigation is begun at once. He believes that the operation completely removes the possibilities of a secondary hernia. It also gives a better position to the appendix and cecum.

THE STAINING METHODS OF TUBERCLE BACILLI, WITH
REMARKS ON THE USE OF THEM.

A REVIEW OF RECENT LITERATURE.

By CARL FISCH, M. D.

1. THE USE OF ANTIFORMIN IN WORK ON TUBERCULOSIS.—Uhlenhuth and Xylander (*Arbeiten aus dem Kaiserl. Reichsgesundtsamt*, Vol. 32, Heft 1, 1909).
2. THE DEMONSTRATION OF THE TUBERCLE BACILLI BY ANTIFORMIN AND ITS USE FOR HISTOLOGICAL DIAGNOSIS.—H. Merkel (*Muench. med. Wochenschr.*, 1910, No. 13).
3. ABOUT THE MORPHOLOGY OF THE VIRUS OF TUBERCULOSIS WITH SPECIAL REFERENCE TO A DOUBLE-STAIN.—Leonhard Weiss (*Berl. med. Wochenschr.*, 1909, No. 40).
4. ON BIOCHEMISTRY OF TUBERCLE BACILLI.—G. Deicke (*Muench. med. Wochenschr.*, 1910, No. 12).
5. ABOUT THE GRANULAR FORM OF THE TUBERCLE BACILLI NOT STAINABLE AFTER ZIEHL.—H. Much (*Beitr. z. Klinik der Tuberculose.*, Vol. 8, Heft 1, 1907).
6. ABOUT THE NON-ACID-RESISTING FORMS OF KOCH'S BACILLUS.—H. Much (*Ibid.*, Vol. 9, 1907).
7. P. v. Baumgarten.—(*Jahresber. f. pathog. Microorganismen*, 1909, p. 416).

A comprehensive discussion of the methods which demonstrate the presence of tubercle bacilli by the microscope, especially along the lines lately developed, is hardly justifiable. This thought is based on the fact that considerable harm is done by making the diagnosis of tuberculosis following a clinical examination of secondary importance: an examination which should result in a conclusion *pro or contra*. If the microscope is depended upon altogether, the diagnosis is not made until tubercle bacilli appear in the sputum. Tubercle bacilli appear only outside the body when the tuberculous processes are either cutaneous or mucosal, intestinal, renal, or vesical; hence, it is easy of comprehension to realize that in the majority of the pulmonary infections the appearance of tubercle bacilli is the evidence of an active and advanced stage of the disease, with tissue destruction.

The diagnosis of pulmonary tuberculosis, especially in its early stages, is often difficult, and few physicians have the courage to make the diagnosis of tuberculosis before destructive lesions have been made by the infection resulting from tubercle bacilli as demonstrated by microscopic examination.

This is the factor that makes the result of most of the attempts of to-day to deal radically with the elimination of tuberculosis necessarily negative. These attempts never can result in success, since many indisputable reasons show their uselessness. A discussion of this question is not germane to the subject of this review. It is, however, the main problem in dealing with tuberculosis.

From this it will be plain that the increased facility in the diagnosis of tuberculosis, on account of finding tubercle bacilli, is not only obvious in pulmonary lesions, but also in other tuberculous lesions. While granting this, it must not be overlooked that when tubercle bacilli are found, the process has advanced to the stage where there is destruction of tissue. As regards the infection of the lung, when this stage obtains, the prognosis is always more or less doubtful. To sum up, instead of teaching that the diagnosis of pulmonary tuberculosis is altogether dependent on the finding of tubercle bacilli, we ought to place in the foreground the necessity of a thorough and prolonged clinical study of the condition, aided eventually by specific tests.

Similar to the Widal reaction, the dependence on the demonstration of the tubercle bacilli leads very frequently to grave and dangerous delays and missteps. This statement should be emphasized, since tubercle bacilli are only confirmatory of a clinical diagnosis, just as is the case in typhoid fever. The means of finding the bacilli must be reliable and applicable to all forms of the infection and under all conditions. But only too often the bacilli cannot be found by the methods now in vogue. The importance of finding them means the protection of people against infection from the continuous contact with tuberculous individuals, but as regards the infected individual, it means nothing, since we ought to know that the tubercle bacilli must be there.

The methods, since the time of Koch's discovery of the tubercle bacilli, have dealt with the resistance of the bacillus to the ordinary anilin stains, to which other bacteria readily respond. Very concentrated solutions of the stain had to be used and the capacity of staining was enhanced by the addition of carbolic acid or anilin. In this way, in a short time, the bacilli could be stained either by heating the staining solution to boiling-point, or by leaving the bacilli in the solution at room-temperature for 24 hours. If other bacteria were present, they took the same stain as the tubercle bacilli and had to be differentiated from the other bacteria by decoloration in acids. Tubercle bacilli retained the stain, while the other bacteria were decolorized and could be counter-stained by another staining solution. The most frequently used stains were carbol-fuchsin and as counter-stain, methylene-blue.

These methods still dominate the search for tubercle bacilli; they are good methods and are, for practical purposes, sufficient in the great majority of cases.

The experience of many years, however, has revealed that these methods are far from showing all the tubercle bacilli in a specimen; in truth, many bacilli are present that do not respond to the stain. The knowledge of this deficiency in the method, and also the fact that in cases with very few tubercle bacilli in the specimen, either failure to find them had to be recorded or a tedious search for a single bacillus was necessary, led to attempts to collect the bacilli present in a very small volume. This obtains, especially, for sputum. Methods of homogenizing sputum by various chemicals which would dissolve mucus were worked out. They were, however, not satisfactory in many cases, for the reason that only seldom could all the mucus be dissolved. The strength of the substances used interfered with the staining quality of the bacilli and sometimes even destroyed them. Peroxide was also used, but did not give reliable results, either.

To-day, the collection of all tubercle bacilli in a large amount of tuberculous material is made accessible to anyone who has to search for tubercle bacilli in which the direct method has been negative. Uhlenhuth

and Xylander took into consideration the corrosive action of a solution called Eau de Lavelle, which consists of a mixture of calcium chlorate and potassium carbonate in water. The solution had been used before for liquefying sputum, but its effect was unsatisfactory. The authors named added to this mixture a 5 per cent. solution of potassium hydrate, both mixed in equal parts and for use diluted ten to forty times. This combination was called by them "antiformin" and is to-day in use in every laboratory and even in private practice.

I shall limit this discussion of the method, since in this *Journal* the subject has been dealt with before. But one thing should be emphasized—mainly, the ease with which a small or large number of bacilli can be collected in a small quantity of sediment from the centrifugated liquefied material.

A few remarks may be made about the great applicability of "antiformin" for a great number of different objects. It can be used for dissolving tissues, in which only too frequently the search for bacilli in sections is either negative or a tedious examination is necessary to find one or two bacilli. The search in urine for tubercle bacilli and in exudates is facilitated by this method and will do away with the necessity of animal inoculation in many cases. Imbedded tissue, after removing the paraffin, and after soaking in water, will likewise be dissolved.

Another very important result from the use of "antiformin" is that almost all of the other bacteria in the sputum are destroyed, only few spore-forming bacteria remaining. The sediment consists in most tests only of tubercle bacilli. The latter are not changed by the process in any way; they stain normally and remain alive and fully virulent. It is easy to obtain a pure culture from the sediment and to inject animals with the sediment without the usual secondary infections. For this procedure the dilution is preferably made low (1 to 40). Of course, for the material obtained by "antiformin" the same deficiency of the Ziehl methods obtains as for the fresh material. It may be said here that "antiformin" is accessible to material prepared by it to be stained after a method with which we have to deal now *in extenso*.

What we have in mind is the very important work done by Much and first published in 1907. He was struck by the fact that in the lymphatic glands of children, glands infected by the bovine bacillus, no bacilli can be found by the Ziehl method or with the Gram stain, while the glands are virulent for guinea-pigs and by inoculation kill them with typical tuberculosis. Furthermore his attention was called to the frequent sudden disappearance of tubercle bacilli from the sputum of pulmonary tuberculosis, with return of them later. A third observation resulted from the great difference that obtains in a number of guinea-pigs in the same stage of tuberculosis, and the great difference in the tubercle bacilli demonstrable in the single animals of the series. He tried the Ziehl and the Gram methods without results, the problem remaining as obscure as before. Experimenting and changing the Gram process in different ways, he finally succeeded in finding a way of solving the problem. His discovery of this method was not the means of demonstrating tubercle bacilli, but the explanation of hitherto obscure processes in tuberculosis. His results are of high scientific importance, almost revolutionizing the conceptions of the process of the tuberculous infection. The immense practical importance was not his purpose, and to consider Much's work as only an improvement on finding bacilli is wrong. His work has thrown a new light on the nature of the tubercle bacillus and its morphological developmental and, perhaps, its "ontogenetic" origin. In his first pub-

lications he described that in specimens not showing bacilli by Ziehl's method, though the cases of tuberculosis had been clinically and histologically established, he could by his method easily demonstrate granular bacilli and a great number of granules, the latter being found in clumps or singly. Old cultures of tubercle bacilli showed only few uniformly stained bacilli; the majority showed the granular type. Very old cultures exhibited very few granular bacilli, the cultures consisting almost entirely of granules: many single granules, a great number of smaller clumps and even large masses. I have been able to produce with this material, when carefully examined in darklight illumination in which they appear very characteristically, only granules and a few pairs and triplets. A guinea-pig was injected by me with this emulsion subcutaneously, the animal dying after four weeks from typical tuberculosis. The smears from the organs showed with Ziehl's and Much's methods a moderate number of tubercle bacilli; in the Much specimens many granules were seen. The finding of typical tubercle bacilli in the body showed conclusively that they had arisen from the tubercular granules. Two years ago, Much in his investigations demonstrated the same result; hence, Baumgarten's objection that there is no scientific proof for the connection of these granules or the granular bacilli with the infection in tuberculosis does not hold.

Another confirmation of Much's investigations is the result of an experiment which I made. Much had reported that the granules could be grown on media and that the result was the growth of tubercle bacilli, staining with carbol-fuchsin. I used for this purpose a cerebrospinal fluid, that contained only granules and short bacillary fragments of two or three granules. Ziehl's method was negative. In making the cultures on serum-agar, I followed up the growth and could observe, from week to week, that the granules grew to typical bacilli, positive to carbol-fuchsin. The details of these observations will be published in this *Journal* later.

Much's work has definitely established that the tubercle bacilli is not of the morphological and physiological character which other so-called bacteria exhibit. While the other bacteria propagate by division, there are bacteria which produce spores. These spores are means of preservation of the race; at least, that is the prevailing biological explanation. That this is only a human conception is clear and cannot be proved scientifically. The logical work of natural science knows only facts and the mechanical connection of facts building up the course of what we call "natural processes." Natural science has to consider only facts and not attempts to connect them with each other on the basis of our limited perceptive capacity. The connection of facts by some purpose and the conclusions from the fulfilling of this purpose is not objective but subjective. Biology works subjectively, not objectively.

In the matter of the results of Much's work, the admirable feature is this entirely objective consideration of the facts which he established by his work. They show with certainty that the tubercle bacillus and its congeners are different from other bacteria—that they belong to another type of small organisms. The findings of Much definitely show this one fact, e. g., tubercle bacilli do not in their life and development follow the way that the bacteria take. Because they are the most important menace to the human race, they stand in the foreground against all other pathogenic microorganisms. In this respect Much's work will be of great influence on work in tuberculosis.

The fact that the tuberculous virus has two forms—the bacillus and

the granules—which can change from the one to the other, is now established. Any speculative explanations are out of the question at the present time, and all the suggestions so far made as to the double life of this bacillus are not based on any facts. However, the certainty that this double life exists will be the stimulus for work in many directions, and will necessarily influence many theories about obscure problems. The sudden disappearance of tubercle bacilli in the sputum, for longer or shorter periods, with a return afterwards is a mystery that heretofore has not been explained. Much has shown that the sputum, in the absence of acid-fast bacilli, contains only granules which under conditions unknown to-day become bacilli. This observation by Much has already led to speculations about relations between this change and the simultaneous character of the effect of the infection on the individual, interpreting it as evidence of improvement (biologic phantasm). The scientific and theoretical side of Much's discovery has become quickly utilized for practical purposes. Much's method will show in the first place usually a greater number of bacilli than with the carbol-fuchsin; in the second, it will demonstrate the granules. His original method is preferable as a quick method of orientation. The pictures obtained are definite and clearly outlined. Weiss has changed the method by making a combination of the carbol-fuchsin method with the Much method. Both methods are equally reliable. While the combination method has the advantage that the specimens prepared by it are permanent, the specimens after Much fade very soon.

For the purpose of giving physicians a chance of becoming acquainted with the method, I subjoin the details of the two methods—Much's and Weiss'. I would warn the experimenter to be very careful before expressing an opinion, as considerable experience is required to differentiate the granules from very small cocci. The granulated bacilli may also be mistaken for small chains of very minute streptococci or even staphylococci. A close study of a sputum with many tubercle bacilli and of any other tuberculous material is necessary, if one desires to become familiar with the characteristic shape of the tuberculous granules. The study of a very old culture of tubercle bacilli is very instructive in this respect.

MUCH'S METHOD FOR STAINING TUBERCLE BACILLI.

Methyl-violet B. (Gruebler.) Saturated alcoholic solution.

Carbolic acid: 2 per cent. watery solution.

Add 10 c.c. of methyl-violet solution to 90 c.c. carbolic acid solution.

Prepare smears rather thin and as even as possible.

Dry in air. Fix gently in flame.

Cover slide with methyl-violet solution and heat to boiling point once or twice. Wash stain off in water.

Pour on slide Lugol's solution and keep it covered with it for 5 minutes. Wash off with water.

Pour on a 5 per cent. solution of pure nitric acid for 1 minute.

Pour off and replace for 10 seconds by a 3 per cent. pure hydrochloric acid solution.

Put immediately without washing in a mixture of equal parts of pure acetone and absolute alcohol; decolorize by moving the slide till the smear is colorless and wash off with distilled water; dry gently with filter-paper and slowly but thoroughly dry over a flame. Balsam.

WEISS' DOUBLE-STAIN.

Mix one part of methyl-violet solution with 3 parts of carbol-fuchsin. Mixture keeps a week.

Otherwise as in Much's method.

In both methods a counter-stain is desirable, either a much-diluted solution of fuchsin or a 1 per cent. watery solution of safranin. The results are much better if the slides are left from 24 to 48 hours in the staining solution at room-temperature.

ORTHOSTATIC ALBUMINURIA.

A REVIEW OF RECENT LITERATURE.

By ALFRED FRIEDLANDER, M. D.

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1. ORTHOSTATIC ALBUMINURIA.—Goetsky (*Jahrbuch f. Kinderheilk.* Vol. LXXI., April, 1910).
 2. ORTHOTIC ALBUMINURIA.—Fischl (*Archiv. f. Kinderheilk.* Vol. LII., p. 262).

For many years, this condition known as orthostatic, orthotic, cyclic or lordotic albuminuria has been discussed in pediatric literature. Some two years ago Jehle offered a new explanation of the pathogenesis of the condition, and at present the subject is being made the object of special study. Orthostatic albuminuria occurs most often in childhood. It is not often seen before the age of 5, and the incidence then increases rapidly up to the time of puberty, then rapidly diminishing again. Cases do occur, though not frequently, in adult life. The albuminuria only occurs when the patient is erect, disappearing when the patient is kept horizontal. Signs of actual nephritis must be totally absent in the pure cases, although in some cases casts are found, in the mixed forms.

The condition is certainly not rare. Reyther examined 360 children, and found that 12 per cent. showed orthotic albuminuria. Martius found 86 cases in 304 children (28 per cent.). Goetsky found 51 cases in 346 children (14.5 per cent.). On the whole it would appear that females are affected more frequently than males. A familiar tendency to the condition has long been noted. With reference to the clinical symptoms, Heubner has shown that the children are apt to be tired, listless, suffering from headache and pains in the extremities. Anemia is frequent. There are no lesions of heart or lungs, and no direct evidences of kidney trouble. Many cases show a tubercular inheritance, and concomitant glandular and joint tubercular lesions are common.

In another group, the children are robust, with tendency to headache, recurrent vomiting, gastro-intestinal disturbances and skin lesions (urticaria, etc.), with various vasomotor disturbances. In a third group there are no subjective symptoms. In these cases the albuminuria is discovered either accidentally, or as the result of systematic examination of series of children. According to Fischl the children of the first group usually show the effect of too rapid growth. Blood examinations in these cases have shown that the anemia is more apparent than real, and this type is therefore by some observers held to belong to an angiospastic form. It has been noted that in these cases the heart and vessels are in a condition of irritable weakness. Fischl has, however, never been able to find evidences of cardiac dilatation. The albuminuria appears in a short time after the patient stands in a particular position, and disappears equally rapidly when the patient lies down. Shortly after the patient arises, the albumin appears, rapidly reaches its maximum, gradually sinking in amount toward evening. Under certain circumstances, how-

ever, and with certain bodily exertion, the amount of afternoon albumin may become increased. The pulse findings are very varied in tension and frequency according as these patients are horizontal or erect. The sphygmograph shows great variations in the tracings as does the sphygmomanometer in the blood pressure on change of posture. There is, however, generally noted, a constancy as to the product of blood-pressure and pulse-rate. With reference to the urinary findings, great diversity of reports is recorded. Goetsky, from his study of the literature and of his own carefully observed cases, finds that while in pure orthotic albuminurias, morphologic elements are never found, there are also cases in which casts and blood cells are found without a coexisting nephritis. It is admitted, however, that these cases shade rather closely into the cases of chronic nephritis of childhood as described by Heubner. If these border-line cases become the subjects of intercurrent infection of various kinds, the chronic nephritis is particularly apt to follow.

Functional tests of the kidneys, with phloridzin or potassium iodide have given divergent results in the hands of different observers in these cases. So, too, with the experimental use of diuretics. It is interesting, incidentally, to note that von Noorden has regarded these cases as a form of "diabetes albuminosus," with disturbance of the metabolism which renders the blood-protein more diffusible. This view has, however, not found general acceptance.

The differential diagnosis between orthotic albuminuria and chronic nephritis will thus be seen to be a matter of great difficulty in some of the border line cases. The absence of any evidence of cardiac hypertrophy, of pulse hypertension, albuminuric retinitis, and of the ordinary causative factors concerned in the production of nephritis will be of service in the differentiation.

With reference to the pathogenesis of the condition a really enormous amount of patient and ingenious study has been accorded.

Edel long ago showed that the cause of orthotic albuminuria was to be found in circulatory disturbance. He found that the volume and tension of the pulse were more "resistant" in the albumin free, than in the albumin present periods.

Erlanger and Hooker, by a long series of experiments, carefully worked out, showed that the albumin is purely postural; that the albuminuria is due to disturbance of vasomotor regulation controlling changes of level of the body fluids in the body. Thus they showed that if a patient with orthotic albuminuria wore pneumatic hose, which forced the body fluids out of the lower extremities under a pressure of 50 m. m. Hg., no albumin would appear even in the erect posture.

With the albuminuria they found, running parallel: (1) An increase in the minimal pressure without increase in the maximal; (2) a lowering of blood-pressure.

They also showed (experimentally) that the blood-pressure *in the kidneys* was lowered during the albuminuric periods.

Frank was able to show that faradization of any part of the body surface would cause the temporary disappearance of the orthotic albuminuria.

Through direct thorax compression, Schreiber was able to induce albuminuria in twenty out of twenty-six cases.

The most satisfactory direct clinical explanation of the orthotic albuminuria has been offered by Jehle.

He found by careful examination of a large series of patients with this condition, that they all had either a definite lordosis in the lumbar part

of the spinal column, or a decided weakness with tendency to curvature there (potential lordosis). In any position of the body in which this lordosis, with its consequent direct renal pressure, can be brought forth, the albumin at once appears.

Jehle admits (and it must be noted at once that this is the weak point of his otherwise interesting theory) that not every patient with lumbar lordosis shows albuminuria. There must be, in addition a disposition of the kidneys to albuminuria (which disposition is, however, not specifically defined). Jehle holds that the lordosis produces a local kidney stasis and that the albuminuria occurs as a result. Thus the albuminuria is the result of a particular body-posture, brought about by the lordosis in the lumbar column, causing renal stasis. This mechanical pressure produces albuminuria in cases where the additional predisposing type of kidney is present. The intensity of the albuminuria varies according to the degree and prolongation of the pressure.

Jehle has even been able to produce albuminuria by the artificial production of lordosis. Other observers have not succeeded in so doing. In a whole series of animal experiments, however, Fischl was able to produce albuminuria in rabbits by direct mechanical pressure brought about in various ways (reported in detail in the article above cited). Microscopically the urine contained casts and epithelium of all kinds.

According to Jehle most cases of orthotic albuminuria recover as the lordosis disappears. Inasmuch as it is largely a temporary lordosis of growth, it will be seen that according to this view the outlook should be excellent in most cases. This view is indeed generally held, even by those who do not subscribe to Jehle's view of the pathogenesis. Thus Goetsky says that only the constitutional condition producing the albuminuria is to be considered in forming the prognosis, and holds that only the underlying constitutional anomaly should receive treatment. The albuminuria *per se* is not to be treated at all.

Jehle maintains that the only rational treatment is the mechanical one, i. e., special treatment of the lordosis by corsets, etc. The necessity for treating the cases at all arises only from the possible danger of ensuing nephritis as a result of the long continued renal hyperemia.

OBITER DICTA FROM FOREIGN JOURNALS.

MAGIC BELTS IN THE CURE OF THE SICK.

"Physicians who are in the habit of examining many patients," writes Dr. G. Paul-Boncour in the *Progrès Médical* of June 25th, "notice quite often that a number wear belts next to the skin which are ornamented with medals." This custom obtains throughout the world, the only difference being that the rich wear belts of fine texture, while the working classes are content with a coarse cord which is knotted in several places. Whether the belt is worn by the rich or poor, it is supposed to have the same magic properties: it has touched the tomb of some healing saint, been immersed in water with curative virtues, or is made of material that has the power to cure a special ailment. The custom is as old as the world; in all epochs belts have had a symbolic significance; in Rome and, especially, in Greece, special virtues were attached to certain belts; and Christianity merely modified the pagan belief in the superlative qualities of belts consecrated to some healing saint. Thus it will be seen that Christianity did not do away with pagan superstitions, but merely changed them somewhat to suit the times. The remote origin of the custom of wearing belts is clearly shown in connection with the rites which were then performed. The idea of holding diseases in thrall and, above all, those wicked spirits which inspired them, was a widespread idea among the pagans. For a time only the magic belt was worn, but later on certain rites were enacted. At Valenciennes, a Notre Dame of St. Cordon effected a miracle by utilizing a cord. The plague was depopulating the town when lo! the Virgin Mary appeared holding in her hand an immense red cord with which she surrounded the city as if in a protective belt. The plague ceased. In the fourteenth century, the Consuls at Montpellier decided to burn in the chapel of St. Sebastian—St. Sebastian, St. Adrian, St. Anthony, and St. Roch, were the saints especially selected for healing, hence the large number of their statues in the Christian world—a role of wax with which to surround the walls of the city. Often during an epidemic it was customary for families to meet near a church, each family carrying a silk handkerchief, and these placed end to end were made to encircle the edifice and bind the epidemic. In certain districts the churches consecrated to St. Leonard were frequently encircled with iron chains containing old horseshoes, which indicates that St. Leonard's specialty was the curing of equine diseases. In olden times when it was thought that epileptics were possessed, the custom was to girdle them with cords, the object being to bind the devil who was responsible for their disease. "Even to-day," continues Dr. Paul-Boncour, "I have seen on epileptics who come up from the provinces, magic belts, or have noticed marks which indicate their having worn them." The idea of binding pain or, to be more exact, the demon causing it, is observed in the practices which are called into play to facilitate a confinement. Belts made of serpent's skin, not to mention those of St. Rose of Viterbo and St. Christine of Spoleto, etc., have this virtue. No doubt, the idea of the serpent-belt is

of Biblical origin, since, as is only too well known, the Biblical serpent was responsible for the curse of Eve. The Bulgarians place around the abdomen of the parturient, or the house in which the confinement is taking place, a thread which has been blessed. The processions, notably at Candlemas, around a church, are another form of religious rite to vanquish the evil one. These processions are in reality ambulatory belts with magic properties. Approved by Catholicism, these practices are to the faithful what they were to the pagans: rites that hold in check the powers that bring on woe. In the Berry district, Dr. Paul-Boncour saw a practice invoked to drive away the toothache, in which religion had no part. The operator drove a nail into an oak, repeating the rite that the Celts used when a dagger was thrust into a sacred tree to spirit away misfortune; after which he encircled the patient whilst uttering the mysterious words. "These religious rites," concludes Dr. Paul-Boncour, "are always intended to frustrate the agency of a disease." Examples are so numerous where this sort of help is invoked that we may well say superstitions never change. Hence the conclusion must be drawn that even to-day the Christian religion is tinctured with a deprecatory paganism.

DIAGNOSTIC AND THERAPEUTIC NOTES.

SENILE APPENDICITIS.—Martini (*Riform. med.*, 1910, No. 14). In the appendicitis of old people, the process usually progresses slowly, with little or no fever and the formation of a hard inflammatory mass. We have ourselves seen a case in which the clinical picture was typical of cancer at the cecum, and this diagnosis was made. Operation was declined and the gradual but complete disappearance of the tumor proved it to be inflammatory in character.

DESSICATED CULTURE MEDIA.—Thompson (*Lancet*, May 21, 1910). If the ordinary culture media, such as nutrient broth, gelatine, agar and the like, are carefully dried and powdered, they not only keep indefinitely but when redissolved in distilled water produce media perfect in constitution, transparency and reaction. The convenience of such dried media for practitioners or investigators who do bacteriological work only occasionally is obvious. They have not yet been produced on a commercial scale but will doubtless soon be put upon the market.

ADRENALIN IN SPASMODIC ASTHMA.—Melland (*Lancet*, May 21, 1910). Melland reports three cases of bronchial asthma which had proved intractable to all the ordinary methods of treatment but which yielded instantly and completely to hypodermic injections of adrenalin. The treatment seemed to have no influence upon the frequency of the paroxysms but each attack could promptly be aborted by an injection. The 1 in 1000 solution of adrenalin chloride was used and 6 to 10 minims injected at a dose. No ill effects were observed.

THE TREATMENT OF CHRONIC COLITIS BY MEANS OF HOT GELATINE ENEMATA.—v. Aldor (*Therap. Monatsh.*, 1910, No. 4). Few curable affections resist treatment more obstinately than some cases of chronic colitis. L. v. Aldor reports seven cases successfully treated by means of irrigation with hot solutions of gelatine. He dissolves 40 grammes of gelatine in 500-800 c.c. of hot water or better of a solution of Carlsbad salts. The solution is injected at a temperature of 45° C. (113° F.), and is retained as long as possible. In view of the good results obtained by v. Aldor, this method deserves a trial in this obstinate affection.

KARELL'S MILK-CURE.—Mosler and Kuehl (*Ztschr. f. phys. u. diatet. Therap.*, 1910, No. 1). The rigid milk-cure according to Karell has been found decidedly useful in the treatment of obesity and was described, from this point of view, in a previous issue of this journal. Mosler and Kuehl have found it indicated also in myocardial degeneration, whether due to arteriosclerosis or to an old valvular lesion, in the

dilated heart of an old nephritis, in chronic interstitial nephritis as well as in ordinary obesity. They prescribe 200 grammes rich milk four times daily, to be sipped slowly at definite intervals. Two to four pieces of baker's toast may also be given. If the patient dislikes the taste of milk, the latter may be flavored with coffee, cocoa or brandy. This diet is continued for from six to nine days, whereupon the patient is allowed a more generous diet for two or three days. This latter diet consists, in addition to the milk and toast, chiefly in vegetable food, especially string beans, spinach and mashed potatoes. Thereupon he is again subjected to a milk-diet for four to six days and then is again allowed to eat. This alternation of milk-cure and a fuller diet is kept up until a sufficient improvement in the patient's condition is attained. Twelve days may suffice in some cases, in others a month will be required. At the conclusion of the treatment, he is gradually put on a soft, light diet.

THE TREATMENT OF CONSTIPATION BY MEANS OF PERISTALIS HORMON. —Zuelzer, Saar (*Mediz. Klinik*, 1910, No. 11). The hormon of peristalsis is a product of cell activity that is formed in various organs of the body and carried by the blood-stream to the intestines, there to stimulate them to normal peristaltic activity. Zuelzer found it present in nearly all the tissues of the body, but especially in the spleen, whence he isolated it for his therapeutic experiments. The fluid containing the hormon is administered by means of deep intramuscular injections. Zuelzer's results are so astonishingly favorable as to make a certain amount of scepticism inevitable. He reports 21 cases of obstinate, habitual constipation so treated. In 15 cases a permanent cure of the constipation followed a single injection of the hormon; 6 cases proved refractory to the treatment. A few cases of acute intestinal paralysis were also greatly benefited.

Saar reports 3 cases of chronic constipation successfully treated by means of Zuelzer's hormon. A single intramuscular injection was, in each case, followed by spontaneous daily evacuations over a considerable period of time. He, too, found that some cases failed to respond to the treatment. Zuelzer's hormon is not yet on the market but will doubtless be produced on a commercial scale before long. Even if its originator's claims for it prove exaggerated, it is an entirely rational method of treatment and its use may prove a valuable therapeutic measure.

THE TREATMENT OF GASTRIC AND DUODENAL ULCER.—F. J. Smith (*Brit. Med. J.*, March 19, 1910). The writer protests against the exclusively surgical point of view, in the treatment especially of duodenal ulcer, taken by Moynihan and Hutchison. Every ulcer should at first receive internal treatment for several months. Operation is imperatively required only where the ulcer has caused either stenosis or perforation. It is also advisable, however, in the chronic ulcers of older people, especially, if relapses are frequent or if the presence of perigastric adhesions can be established. According to the statistics of the London Hospital the mortality, during the past ten years of gastric and duodenal ulcers treated internally was 9.4 per cent., surgically 17 per cent. Relapses occurred in 8.9 per cent. of the ulcers treated internally and in 12.3 per cent. of those treated surgically.

To our mind, these statistics are worthless, because as a rule the cases

that reach the surgeon are the more severe and intractable ones. The tendency among internists is to distinguish sharply between gastric and duodenal ulcers. The former require surgical interference, as Smith says, only when they have produced stenosis or perforation and in patients over 50 years on account of the danger of cancer. Duodenal ulcers, however, on account of their disposition to perforate without warning, should be operated upon as soon as recognized. In our experience, the point of view of many internists in this matter is more radical than that of the surgeons.

LIGHT TOUCH PALPATION AND MUSCLE SPASM IN PULMONARY DISEASE.—Pottenger. Wolff-Eisner (*Deutsch. med. Wochenschr.*, 1910, No. 16). Pottenger's method of light touch palpation and his views as to the significance of muscle-spasm have been discussed in detail in previous issues of this journal. The former is chiefly useful in outlining deep-seated organs, such as heart or liver, and pathological processes, such as empyemas or pleuritic effusions. In brief, it consists in palpation so light that the finger barely touches the skin. In outlining the heart, for instance, one palpates, with the greatest possible lightness, along the intercostal spaces from pulmonic areas towards the heart. When the palpating finger reaches the skin overlying the edge of the heart, a delicate but distinct feeling of resistance is noted. Other viscera or pathological processes may be outlined in a similar fashion. The recognition of muscle-spasm is a still simpler procedure. The muscles are either palpated, or, if possible, rolled between the fingers. A spastic condition is then readily recognized. This method is especially useful in incipient phthisis which cannot be made out by the usual methods. Over the affected portion of the lung, the muscles will be felt much more resistant than elsewhere. We have used these methods in routine work for nearly a year and have found them extremely valuable.

Hitherto these methods have met with little or no recognition abroad. Wolff-Eisner, however, now expresses himself enthusiastically about them. His views may be summed up as follows:

1. Pottenger's light-touch palpation is a valuable diagnostic method in pulmonary diseases and may also be used with success in palpating the abdominal viscera.

2. Acute muscle spasm speaks for active, or rather fresh inflammatory changes, whereas a less degree of resistance indicates chronic processes.

3. Kroenig's method of percussing the apices, hitherto our best physical method of recognizing early tuberculosis, depends upon the same phenomenon which Pottenger has developed into a new method.

4. The great practical value of Pottenger's methods lies in the recognition of initial, active, tuberculous processes.

BOOK REVIEWS.

THE EXPECTATION OF LIFE OF THE CONSUMPTIVE AFTER SANATORIUM TREATMENT. By Noel Dean Bardswell, M. D., M. R. C. P., F. R. S. (Ed.) Medical Superintendent, King Edward VII. Sanatorium. New York: Oxford University Press. 1910.

This is a valuable little book especially to the medical sociologist. The author has considered the subject of the value of sanatoria treatment, drawing his evidence from the careers of 241 consumptive patients who had been under sanatorium treatment and who had returned to their homes or elsewhere from four to nine years before this report was compiled. Reports have been received from these patients from year to year. The results are summarized in a series of easily read tables, compiled with the primary object of showing what degree of permanent restoration of health has followed sanatorium treatment, especially in regard to the ability to work. The cases are considered together and also divided into incipient, moderately advanced and far advanced cases. A concise commentary accompanies the tables. The latter half of the book contains the detailed after histories of the 241 cases; for the most part of verbatim extracts from letters received from the patients. In considering the question of the economic value of sanatorium treatment it is to be regretted that the author's cases are made up almost entirely of patients in a higher social status. It is to be hoped that similar statistics prepared with equal care and taking into account cases of tuberculosis occurring in the working classes will soon be forthcoming.

TEXTBOOK OF MEDICAL AND PHARMACEUTICAL CHEMISTRY. By Elias H. Bartley, B. S., M. D., Ph. G. Professor of Chemistry, Toxicology and Pediatrics, in Long Island College Hospital, etc., etc. Seventh Revised Edition. Philadelphia: P. Blakiston's Son & Co. 1909.

This textbook has been too long before the scientific public to need introduction. It is the reviewer's opinion, however, that a textbook which aims to cover the subjects of chemical physics, theoretical chemistry, inorganic chemistry, organic chemistry, toxicology, the physiological chemistry of the digestive juices, milk, urine, feces, etc., in the limits of 700 small pages must do so in a way which is inadequate to the needs of the student entering upon the study of medicine at the present day. The book is most complete in its scope of subjects, gives many excellent and concise definitions but is necessarily lacking in its discussions—a no minor fault in a textbook for students. The book, however, has a use and one which it will fulfil very well, that of handy reference book. There are numerous tables, which add to its value in this capacity, among which tables of thermometric equivalents of equivalent measures, of specific gravities, of solubilities, a glossary of unusual chemical terms and a very complete index may be especially mentioned.

CLINICAL BACTERIOLOGY AND HEMATOLOGY FOR PRACTITIONERS. By W. D'Este Emery, M. D., B. Sc. Lond. Clinical Pathologist to King's College Hospital and Pathologist to the Children's Hospital, Paddington Green, etc., etc. Third Edition. Philadelphia: P. Blackiston's Son & Co.

This is a very excellent laboratory handbook for the practitioner who wishes to do his own laboratory work, or who wishes to obtain an appreciative knowledge of laboratory diagnostic methods. The explanation and instructions are clearly and concisely written and amplified by numerous illustrations. The edition has been brought up to date by the addition of directions for preparing vaccines, fuller details of diagnosis by lumbar puncture, etc. The book contains a number of well-executed colored plates—microphotographs which add to its value.

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EDITORIAL.

AS TO MEDICAL COLLEGES.

Things are so well arranged in this world of ours that Emerson's law of compensation is never a negligible quantity. Irritated beyond measure though we were when Abraham Flexner's strictures on our medical colleges appeared, we are no longer writhing under the lashings which recalled us to our shortcomings, for our inherent resiliency has again asserted itself in no mistakable fashion. In the wake of the supposedly devastating trail left by the arch critic, new ideas have sprung up, which, though hardly to be classed under the common name of Flexneriana, are so brimful of life that their hardihood cannot be questioned. What these ideas are the announcements of our many medical colleges are making plain to him who wishes to read and profit; and though an unkind critic might see in them a phase of the medical conscience that is no better than any other conscience, be it business or professional, he must perforce admit that the Emersonian law has again been effected, and that the downtrodden have compensations in the face of withering criticisms. Especially is this true of those colleges which were supposed to bear the brunt of the Flexner onslaught, for though they are somewhat silent on the subjects that were uppermost in the critic's mind, they are showing no hesitancy in telling the advantages of their age as inexhaustible founts of medical instruction and the number of new departments,—of course, with the usual quota of professors,—which they have added to their already extensive curricula. Thus the scales, which only a few weeks ago showed so great an inequality in the matter of balance, have been almost entirely restored to their normal condition, and a challenge is made to Abraham Flexner or any other critic to detect the slightest flaw in a system of teaching that is studded with bewildering perfections.

In former times, when our sense of humor was still pristine, because the serious problems of life were not always with us, we were not unwilling to laugh aloud when the subject of the number of colonels in these United States was mentioned, and great was our mirth when any over-ambitious mathematical mind had the temerity to count up the number, only to be swamped in the vast endeavor. But what would not be the floundering of this same mathematical mind were he to-day to engage in a friendly bout with a complete list of the professors, who are endeavoring to guide the callow mind of the medical student in the tortuous paths of medical science! For without overstating the matter, there are with us as many professors of the art of medicine as there used to be colonels; and what is worse, instead of being social entities that are content with what society might grant them in the way of honors because of their titles and innocuousness, they have all the invincible activity of those strenuous teachers, who think that fittingness has been bestowed upon them, on account of a verbosity that is more than capable of filling the hour which the administration of a school has been lenient enough to grant them.

But if the number of professors is on the increase what shall we say of the new chairs which our ambitious colleges are installing almost daily? In those restful days when anatomy, physiology, chemistry, the practice of medicine, and surgery were the principal studies, the uninitiated mind of the medical student soon overcame the obstacles which lay in his path, and with a mind normally receptive profited by the instruction, even though the lessons did not bristle with those bewildering technicalities which the ordinary professor of to-day has but partially digested. Now, though we are not praying for a return of the simplicities of those early days, we would, nevertheless, consider it a boon, if some limit were placed on the number of studies which at present are achieving such vast proportions in the very colleges that have not the proper equipment to ground their students in what should be their principle studies—namely, the elementary. A slight return to unmodernness would not only benefit the students, but what is much more to be desired, would curtail the number of professors, so that the flamboyance in connection with new studies, which is now made a lure to attract the unwary to colleges that have inherent weaknesses, would not be countenanced for a moment.

Quite a deal has been written of late of the unpreparedness of the medical student for those intricate studies which are to be his fare during his four years at school, and how deplorable it is that his unlettered condition should be the greatest obstacle to his acquiring the scientific spirit that always lurks behind the doors of every medical college. While no one in a normal frame of mind would gainsay the disadvantages under

which a student of this sort is placed, is there not in this constant criticism of the student a desire, on the part of the professor, to glose over his own defects, by detracting attention from himself and making the student the scapegoat for all those deficiencies which are strikingly apparent in the college curriculum? Is it not a fact that the older a man gets to be, the less he realizes his defects on account of his ever increasing egotism, and the more he wishes to impress upon others his worth as a protagonist in his appointed field of work?

If unpreparedness is the charge brought against the student about to embark on medical matters, what synonym of this word could be applied to the many professors in our medical colleges, who have received the "mystic call" that they are specially ordained to teach? The student has the ambitions of youth to impel him into an undiscovered country, whose obstacles appear small before him on account of his inexperience; but the full-fledged doctor should know his limitations, and when the "call" comes to him to assume the duties of a professorship, his estimate of himself should not be the all-sufficient reason for his acceptance. We are not advocating a public declaration of his shortcomings as a teacher—would not this be contrary to the pride that swells his breast?—but only a bit of modesty, and the realization that being a prominent physician and successful in acquiring patients does not proclaim his efficiency to guide the faltering steps of the medical student through the intricate mazes of an almost perfect curriculum.

In a country where every other man is "influential" or "prominent," a means should be devised whereby the efficiency of a physician as an out-of-the-ordinary instructor could be tested other than by the factitious position resulting from a large practice. In England, if we mistake not, there is a flourishing school for mothers, and in France a similar institution obtains. In this country there are a number of schools in which journalism is taught, and right successful are all these special schools. Therefore, would it be Utopian on our part to imagine that the day is not far distant when a similar school, wherein the talent necessary to the making of a professor can be tested, shall bear such fruit that no longer will the chaff be so intimately mixed with the grain that a differentiation is almost impossible? When this really does take place, the reading of a booklet, containing the promises of a medical college, will no longer have the interminable list of nonentities that offends the eye to-day, but be as near the quintessence of worthiness as lies in the power of exactitude and stringency.

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THE PROPER AGE FOR RETIREMENT FROM BUSINESS.

The ordinary normal tissue changes which occur with age render us less and less capable of efficient work and a time comes sooner or later when any labor is impossible. In certain employments the losses of life and property from senility render it essential to fix a time at which retirement is compulsory, and the medical profession is the proper judge as to this age, though as a matter of fact it is arbitrarily determined by laymen as a result of sad experiences. For instance, the command of ships requires the quick, accurate, mature judgment of vigorous middle age, and it is found that by sixty the mental processes are so slow as to render captains unable to surmount the emergencies of their calling. To be sure, no two men are alike and there are marked exceptions to the rule, some being senile at 55 or even 50, while a few retain mental agility until 65. No man realizes his own growing incapacity, and for this reason he will not voluntarily give up work, but ship owners finally realized that their greatest losses were vessels commanded by their oldest, most experienced and most trusted employees—often it was the first "accident" which had happened to an officer in a long career. It is now a fixed policy to place these men on a retired list somewhere in the neighborhood of 60, a matter for which the travelling public is to be congratulated now that the enormous number of vessels in certain parts of the ocean makes navigation particularly difficult and beyond the powers of all except those in the full vigor of manhood.

Railroads, too, are finding that their profits are increased by the compulsory retirement of officials, but the age selected depends on the character of the work,—a mere clerk, for instance, may be retained at an age prohibitive for dispatchers. The higher officers hold on the longest, though it is realized that their conservatism may prevent beneficial changes in equipment or methods. As far as the public is concerned, the locomotive driver is the most important, but here, too, natural selection is at work so that the runs requiring the most accurate and the quickest mental endowment are in the hands of men at the period of highest vigor. In other businesses the same rules hold good, though here and there the demand for youth has been carried to an unprofitable extreme and there is a reaction due to the discovery that the experience of men over fifty is indispensable even if they work more slowly than men of thirty. Yet here, too, the age of inefficiency comes at last and the employee must give place to the next generation as he has always done since the beginning of things.

In former ages the old men were killed off by younger competitors, and in primitive civilizations those of forty were very old. With the

progressive lengthening of average life, it is found that society is burdened with a constantly increasing number of aged incompetents and the matter of their support is occupying the attention of statesmen the world over. Corporations are all taking the initiative by the creation of retired lists, as they find that they obtain better service from loyal employees who are sure they will not be cast adrift when no longer useful. But in the case of those working for smaller firms or private interests which cannot afford a retired list, the governments must step in. The poorhouse has utterly failed, for it is looked on as a disgrace and self-respecting men prefer death. England is solving the problem by general taxation, but on the Continent numerous funds are being created for the purpose by forced contributions from the laborers themselves. Japan has an ancient system forced on her by the conditions of her existence, and it is now a custom for men to retire early in favor of their sons who are then morally and legally bound to support the old folks. Perhaps her remarkable progressiveness is partly due to the fact that nearly all her activities, public and private, are in the hands of men in the prime of life who are vastly aided by the counsels of the elders. There is even a council of elder statesmen, whose decisions have great weight with the actual officials.

In the case of men working for themselves, retirement is naturally postponed until complete disability, but it is now being seriously discussed as to whether this is wise from a social standpoint. The increasing number of unemployed all over the world is giving most serious concern and it is thought that perhaps greater efficiency would result by finding room for some of them by some sort of retirement scheme for the aged, but so far no practicable method has been devised.

The sad side of retirement is the increased rapidity of senile decay which follows in the absence of interests to pass time and occupy attention. It has long been known that in the case of men who can find no avocation, such as retired naval officers, the death rate is enormously increased. Unoccupied retirement is therefore a sentence of death—a sacrifice of the individual for the benefit of the social organism. Yet this decay is wholly unnecessary if retired men will only take up one of the thousands of unremunerative things which ought to be done but which no one in his prime can attempt. It is the part of wisdom, of course, to have an avocation, in addition to one's vocation, for it is really the best kind of recreation, and upon retirement the avocation will insure long life. Darwin's work was really the avocation of a retired invalid. Men often complain that they have no time for an avocation, but we must explain to them that they accomplish more if they make

time—besides there is the happy consciousness that our recreations are profitable instead of expensive. Then when retirement is possible, the closing years of life will not be the painful burden of the old pensioner.

These matters are of vital concern to physicians, who must realize that sooner or later a time comes when we cannot make a diagnosis as we did in our vigor, when we forget a drug or its best dosage, when we cannot remember the new things we read in our journals and when the sick would be infinitely better off if we were only so situated that we could say to them: "You must seek a younger man." Like the Japanese we can give counsel and experience as long as we retain some memory, but let it be candidly understood that the knowledge is merely to modify present methods. In other words, a retired list for physicians is a social necessity and in addition we should be saved the painful spectacle of the aged penury of those forced to the wall by natural law. Physicians spend more than half of their time in labor for society and then in the end society lets them rot. No class of men are more entitled to old age pensions and no class should be more willing to retire and occupy themselves with the thousands of avocations connected with medicine, leaving the sick to those best qualified. Surely society would be the gainer and surely the sick are entitled to the best, and more surely still, the aged can not give the best. The proper age for a medical pension is of course an open question, and the source of the funds also. Shall we follow England and demand public pensions, or Germany and create funds in associations? Retirement on pension is coming here, as surely as abroad, so let it be discussed. It is nonsense to assert that physicians should prepare for the final rainy day; experience shows that they cannot accumulate and must die in the harness, staggering on to the end. The overcrowding of the profession is prohibitive of success to more than a few, and moreover those who do the most charity work are often the very ones who have not the cold-blooded ability to insist upon fees. That is, service to society is a self-injury entitling the servant to honorable retirement.

OPINION AND CRITICISM.

MEDICAL NEWS AND THE DAILY PRESS.

Again the daily press enlightens the world with remarkable news. We read that Ehrlich has discovered a "serum for the cure of one of the most dreadful of blood diseases, whose ravages extend even unto the third and fourth generation, and a cure for which has been sought in vain by medical investigators for five hundred years. This *serum* is known as dioxy-diamido-arsenobenzol, or number 606, it being Ehrlich's six hundred and sixth discovery." We shall discuss the true nature of this exaggerated report later; now we wish to use it as a basis for some remarks on the relation of medical news and the daily press.

Powerful as is the influence of newspapers on the thought and evolution of a people, serious attention should be given to the careless way in which medical items are handled. Every physician can recall countless cases when his patients or friends have consulted him as to the accuracy of newspaper reports of medical news. We learn of cancer cures galore, to which the names of eminent scientists are appended in the same free manner as the names of the socially prominent are attached to the list of those present at certain functions; we read with grim delight the unconscious humor of most of the attempts of the lay press to enlighten their readers on the progress of medical science. Yet no criticism can be made of the object of these attempts. The lay world is rightly interested in medicine, and the greater this interest, the better chance has preventive medicine of carrying out its policies of improvement to the general health; consequently there should be means of dissemination of medical knowledge to the public, and no vehicle can carry this burden so well or so thoroughly as the daily newspapers. But in questions involving medical news, either of a purely scientific nature, or of more general worldly interest, the truth must be handled without gloves; half a truth is quite unpardonable, and an exaggerated or misinterpreted statement is too misleading to be other than harmful.

We grant then, that medical news should be distributed by the daily papers, yet we criticize severely the methods of the papers in handling such news. It stands against reason that a person unacquainted with medical literature can be equipped to write articles on medical subjects that shall truthfully give the news the article wishes to convey; and therein, it seems to us, lies the fallacy of the present situation. Medical material must be written, or supervised by a medical man, and if our criticism so far has been destructive, we offer a constructive conception of co-operation between the papers and the profession. Whether it be possible for a newspaper to include on its staff a medical editor, either

consulting or active, we cannot say, but if such a person on the staff were made responsible for the accuracy of all medical items, the paper would subserve its function of purveyor of news in a manner decidedly to its own advantage, and to the better interest of the public. In addition to this arrangement, medical articles on timely topics could be furnished the dailies by the local medical societies, among whose members surely some one can be found gifted with the art of writing naturally, unintelligible matter in an interesting manner. Perhaps no better reference to the value of this arrangement can be made than by recalling Dr. Woods Hutchinson's articles, the material of which is always good, and the style unusually pointed.

CHEMICAL CURES FOR SYPHILIS.

Now as to the underlying truth of the newspaper reports. The evolution in the use of drugs through the gunshot prescription period and the stage of therapeutic nihilism, to the present state of judicious application of a few necessary drugs, is well known. The introduction of specific sera in the treatment of diphtheria, tetanus, cerebro-spinal meningitis, coupled with a vast amount of biological research on the natural defences of the body against infection, the extensive chemical studies of metabolism on so-called constitutional diseases, the valuable work on the exact physiological action of drugs, caused much scepticism as to the therapeutic worth of most of the drugs commonly used in practice.

The comparatively new science of experimental pharmacology and therapeutics developed, and in the lead stood Ehrlich. This marked a new era in the use of chemical preparations. Ehrlich, whose name for years has been attached to some of the most interesting problems in medical logic, turns his attention now to a more empiric field,—the effect of new drugs on the cause of diseases in animal and man. Hitherto pharmacology had been limited to the study of known drugs on normal animals; the action of strychnine, of morphia on the heart of the frog was known, but beyond the use of quinine in malaria, and mercury in syphilis, practically nothing could be stated of the curative effect of drugs in disease. The discovery of the spirochete and its biological associations with the trypanosomes, made this class of diseases a good one to start on; and arsenic was used as the base for the chemical compounds to be studied. First, atoxyl was manufactured and found efficacious in the spirillum and trypanosome group of diseases of animals and in human syphilis. But it did not fulfill Ehrlich's conditions, in that it produced harmful effects on the optic nerve of the host, in addition to destroying the parasite of the disease. Arsacetin, the next compound tried, also produced untoward effects, and was discarded in favor of arsenophenylglyzin, which seemed to approach closer the goal of a *therapia sterilans magna*. Mild effects, such as a rise in pulse rate, ma-

laise, and a scarlatiniform eruption stimulated the Frankfort investigators to still further work, which has resulted in an apparently startling discovery. Dioxy-diamido-arsenobenzol was synthesized, tested on animals and man with truly remarkable results. To fulfill the object of Ehrlich's attempt, one dose should be sufficient to destroy the spirochete, and thus cure the disease without producing damage to the host, and in this new drug he seems to have accomplished this result. Numerous cures of syphilis already have been reported by competent clinicians, and unless further investigations should show evil effects, the prolonged uncertain battle against syphilis will be succeeded by a rapid sure fight, in which one blow will be sufficient to win.

EXPERIMENTAL TYPHOID FEVER.

In not all bacterial diseases have Koch's requirements been fulfilled. In typhoid fever, for instance, whereas the typhoid bacillus can be isolated from the patient, and can be artificially grown; until recently, no one has succeeded in producing typhoid fever in animals and recovering the organism. In fact, among some scientists, the lack of definite proof that the organism could produce the disease in animals, caused some doubt as to whether it really is the cause of the disease; consequently, the link in the chain of evidence just announced from the Pasteur Institute of Paris, is convincing. Metchnikoff and his co-workers have succeeded definitely in causing typhoid fever in monkeys, by feeding the excreta of infected patients. The course of the disease is short, but similar to typhoid in man, and from the stools of the monkeys, the typhoid bacillus has been isolated. Furthermore, the pathological changes in the intestine are practically identical with the lesions found in human typhoid. We can hope from this announcement that at least a start has been made on the specific serotherapy of typhoid.

LITERARY NOTE.

"The art of healing," writes Dr. A. Soulié in *Le Progrès Médical* of July 23rd, "may be traced back to the remotest antiquity, since in all epochs it has been the desire on the part of mankind to ward off pain." Now if we are to believe those who have undergone the tortures of toothache, this ache is without question the most insupportable; and though other bodily inflictions are not to be scoffed at on account of their attendant discomforts, they have no right to the palm which rightly belongs to a tooth that misbehaves. Hence it is not surprising that dental therapeutics is not of recent date but was even known and exploited in those remote times which antedate the Christian era by many centuries. The most ancient document which we possess on the subject

is of Egyptian origin, the "Papyrus Ebers," so named because it was found by George Ebers, the well-known Egyptologist, in Luxor in 1873. This scroll published in German in 1874 under the title "Papyrus E. ein hieratisches Handbuch der aegyptischen Medizin" (Papyrus E., a Hieratic Handbook of Egyptian Medicine), is admitted by authorities to be the oldest known document in medicine. It is twenty metres long and the text is divided into 108 sections. According to students of antiquity, it is less an original work than a collection of methods of treatment which were in vogue in Egypt from age to age. Begun in the year 3700, it was finished in 1550 B. C. and then reverently buried by unknown hands at the foot of the statue of the deity, Anubis. In this document may be found mention of numerous remedies for inflammation of the gums and for toothache, one of the most popular being pulverized hyoscyamus afterwards kneaded with putty. The mass was placed in the cavity of the tooth and an incantation was repeated three times. But in no part of the papyrus is extraction mentioned, this operation being considered a badge of infamy, since only criminals were compelled to submit to it. Although the Egyptian knowledge of dental therapeutics was extremely crude, already in 500 B. C. special doctors took up the treatment of the teeth, a fact which is mentioned by Herodotus of Halicarnassus, who went to Egypt in 450 B. C. In the second book of his History he states that the doctors divided the practice of medicine into what we moderns call specialties: some made a study of the head, others of the teeth, while others still of the eyes, trunk and limbs. Moreover, the specialists in dentistry in Herodotean times knew how to fill teeth. In mummies dating from this period, the molars indicate that gold was used for filling cavities, the metal being forced into the carious tooth and riveted in such wise that it has remained unaffected after the lapse of many centuries. Some authorities have contended that the gold was used for ornamental purposes. But were this true, the Egyptians, with their taste for luxury, would not have hidden this costly metal altogether from view; in short, they would have ornamented the front teeth in preference to the teeth at the back of the mouth. Ancient Egypt, moreover, was not ignorant of the advantages accruing from dental prosthesis. The rigorous laws of the country punished certain criminals by extracting their teeth; hence, it is easy to understand that when the loss of a tooth was a natural procedure, all means were enlisted to hide the defect. Belzoni, the Italian Egyptologist, discovered in the Egyptian sarcophagi artificial teeth in the mouths of mummies. From a chronological point of view, China ranks next to Egypt in the matter of dental therapeutics. The memorial of Nuei-King, written 2700 B. C. by the Emperor Houang-ty, the founder of medicine in China, makes mention of toothache. The most highly recommended remedy was urine, of which some drops were placed in the carious tooth. But dental therapeutics did not progress with the Chinese as with the Egyptians, for the book is silent on the subject of prosthesis.

ORIGINAL ARTICLES.

THE THEORY, METHODS, AND PSYCHOTHERAPEUTIC VALUE OF PSYCHO-ANALYSIS.

By WILLIAM A. WHITE, M. D., of Washington, D. C.

I have felt impelled to write a paper dealing with the subject of psychotherapy, for a long time, because of the apparent, almost absolute, lack of comprehension which seems to be rife as to what may be included under this term. On the one hand, I hear the subject discussed by those who know much about it but who invariably assume, on the part of their audience, a knowledge which I feel sure they do not possess. On the other hand, I am confronted on all sides by physicians who sum up all that is included under the term psychotherapy with the word "suggestion." These latter men see in the whole subject nothing but the use of suggestion, and assume very much the attitude towards its use, as a psychotherapeutic agent, as do many who consider the writing of a prescription the crowning act of the practice of medicine. These same men, too, will invariably make the statement that all physicians use suggestion more or less in their practice, and have done so since the days of Egypt and Babylon; and their attitude implies that there has been very little, if any, progress in its use or the knowledge regarding it since then. It seems to me high time that this state of blissful contentment, comfortable as it may be, should give way to some realization of the immense amount of work that has been done along these lines in recent years and to some of the results, both theoretical and practical, that have been reached.

In the first place we must escape from the influence of the shibboleth "suggestion," which for so long seems effectually to have blighted any efforts at individual thinking. It has been in the past a word to conjure with and use as a cloak for ignorance. The average use of the term suggestion implies a conception of mind that would permit of the addition of ideas, much as one would sprinkle the particles of salt upon his morning egg and permit their removal in quite as simple a way. There seems to be a popular delusion to the effect that an idea is something almost tangible in its definiteness, something distinct, and quite apart from other ideas and other phenomena of consciousness. To those who have some acquaintance with the phenomena of mind it is hardly necessary to say that all this is absolutely not so.

As an illustration of the complexity of consciousness compared with its simplicity, as implied in the conception of suggestion, let us consider a relatively simple mental fact. Suppose I look at an orange and so have what we call a percept of an orange. This percept, it can at once be seen, is composed of many elements. The perception is possible only as a result of the fusion of many sensations—roundness, yellowness, and the complex sensations coming from the eye-muscles in accommodation—plus the residuals of many previous experiences of the same character and which included the additional sensations of taste, touch, and smell. In addition to all this mass of material necessary to the formation of the percept, I tend to assume a certain attitude of mind towards the orange, to relate myself to it. I am pleased or displeased, the orange is mine or some one else's, and I tend to reach out and possess it with the intention and desire to eat it or I restrain myself because perhaps it is not mine. If now I shut my eyes and think of the orange, the idea of the orange with which I have replaced the percept is different from the percept, and calls up still further and more complex associations. In this illustration we can see how complex a simple mental fact is, and, more important still, how intimately it is bound up in a complex of associations with other mental material. Ideas cannot exist alone; what does exist is a mental state conditioned by events in the environment and related to those events.

Every mental state is a synthesis and like a chemical compound may bear little relation in its qualities to the qualities of its constituent elements. Every mental state, too, reaches back through an immeasurable line of other mental states to the very dawn of consciousness. There is nothing fortuitous in mental life. Determinism holds as definitely in the psychic as in the physical world and no mental fact can exist that has not its efficient cause in antecedent mental states. The sum total of the material of consciousness constitutes the personality, and I trust my illustration will give some vague idea of its almost infinite complexity.

The important thing to remember is the fact that all states of mind have efficient causes and are definitely associated with those causes in quite as inevitable a way as in the physical world. Psycho-analysis would be quite impossible, if it were not for the presence of inexorable law in the field of mind.

Now let us examine a little the effects of suggestion. Perhaps I can illustrate best by a case. One of my patients had a phobia for red. Although very suggestible, sinking readily into deep hypnosis, and accepting posthypnotic suggestions, I found it almost impossible to remove this phobia except for a short time. It kept coming back but I finally succeeded only after I had taken up the same problem with other symptoms. The same patient often thought of suicide. I suggested to her in hypnosis that when the desire to kill herself came to her mind she would think of an hallucinatory cat that had been suggested to her during a previous hypnosis. After this suggestion was made, and I began to work

on the suicide idea, the fear of red disappeared. At first the suggested cat came whenever she thought of killing herself. The cat amused her immensely and the idea of suicide was robbed of its affect. Then the cat came less often and the suicide idea resumed its sway until the suggestion was repeated. This only worked for a short time. The same day she broke a window to get glass to cut her throat. The next day the cat idea came when she thought of killing herself, but it was too weak to displace the suicide idea. During the time these experiments were going on I was trying also another substitution. She had an idea at times that people hated her. I suggested in hypnosis that when this idea came she would see a bright flash which would distract her attention but not alarm her. This substitution worked very well and the idea that people hated her and the hallucinated flash of light gradually disappeared together. It was while this was disappearing, however, that the suicide idea returned in strength as described above. During this time a depression developed, a fear that when she went home she would get worse again. It was suggested that her right arm would jerk whenever she felt this dread. This suggestion was not well carried out and the idea that people hated her returned. Now, while in the midst of these attempted substitutions, she complained that she could not remember the names of persons and even of things; she said that this difficulty was getting worse.

These experiments suggest that we are dealing with conditions similar to those in the physical world that are controlled by the law of the correlation and conservation of energy. At first it is impossible to make the phobia for red disappear. It goes finally when the mind is taken up with the suicide idea. This is particularly rebellious, however. The idea of hate is made to disappear like the phobia for red. The cat idea comes for a while, then weakens and disappears. During this time a depression develops. An attempt to substitute an arm jerk for this is not carried out and the idea that people hate her returns. Then appears an anterograde amnesia. She forgets names of people, where she put her fancy-work, etc. There seems to be just so much energy, but not enough to go around. When it is used in one place it must necessarily be drafted from another, and so, although a symptom may be removed it either returns or some other takes its place. The basket will only hold so many eggs.

We see by these examples that suggestion really plays on the surface. The fundamental, underlying conditions are not reached by suggestion. These underlying conditions which produce the symptomatology of the psychoneuroses are the same conditions that make suggestion possible. The accepted suggestion is quite as much a pathological product as the various symptoms themselves.

The particular way in which a psychoneurosis manifests itself is largely accidental. Given the pathological foundations, any particular thing that may be about and available at the time being may be used as a vehicle of expression. For example, one of my patients had epileptiform

seizures preceded by an aura of green. He had had a fall which rendered him unconscious. He was lying upon a green baize face down so that the first thing he saw on coming to was green. Had the baize been red his aura would probably have been red. Had he been looking up instead of down perhaps he would have had no aura. Another case fell striking her occiput severely, became unconscious, and awoke in an attack—the first one. Thereafter each attack was ushered in by pain in the occiput.

These illustrations serve to show, I think, that the psychoneurotic symptom is an end-product only and that it may be varied to any extent, even removed, without affecting the underlying condition out of which it grew and which made it possible. Just as the old psychiatrists sought patiently in the autopsy-room for the solution of the insanity riddle without appreciating that they were dealing only with end-results, so the psychotherapists have for long been using suggestion without appreciating the necessity of going deeper than the surface in attacking the problem.

Psycho-analysis aims to avoid this superficiality and to go to the root of the whole matter and disclose fully the mechanisms upon which the symptoms depend. In order to explain how this can be done a few words are necessary to outline a little further some of the mechanisms of consciousness and the theory of these abnormal mental reactions.

The field of full, clear, conscious awareness is a relatively restricted one. A mental act repeated a few times tends to become automatic, to retire from the full light of attention so that consciousness may occupy itself with new adjustments. The familiar example of the piano-player is a good illustration. The painfully conscious attention to every detail during the period of learning is later substituted for a nonchalant, quasi-automatic production of a piece while engaged in casually carrying on a desultory conversation. Clear consciousness only arises at points of conflict, at times when new adjustments are to be made. All other acts tend to sink into the dimly lit, twilight regions from which the focus of attention has been removed.

The majority of our acts then are controlled from this subconscious or unaware region of mind, relatively few being directed from the field of full, clear, conscious awareness. Let me give an example to illustrate this and how clear consciousness only arises under the necessity of a new adjustment. A lady to whom I have occasionally to address a note had asked me to address her by her given name and middle initial rather than the way I had been addressing her. I had occasion to write to her several times but did not comply with her request. She called me to account for not doing so and thus forced me to discover why I had not. In analyzing the situation I found that each time I had written to her I had had a distinct feeling of conflict, when I came to address the envelope without being fully conscious of the reasons for it. Further analysis showed the components of this conflict to be a knowledge that there was another person by the same surname in the apartment where she lived, and, while

I knew my letters had never heretofore gone astray, I did not know the other person's given name, and thus felt the possibility that they might be the same; then the name I was requested to use called up a painful memory which I automatically escaped by not using it. These inhibitions naturally interfered with carrying out the request and I went on following the line of least resistance, controlled by the subconscious motives. By bringing the whole matter fully to my attention, into clear consciousness, a new adaptation, a compliance with the request, became possible.

This example is a very good illustration of the mechanism as we see it in the psycho-neuroses. The psycho-neurotic suffers from just such a disintegration of the elements of his personality. Certain mental states are not adequately synthetized. These are the disagreeable experiences of life. The mind in self defense, endeavors to crowd out, to relegate to the limbo of the forgotten, experiences and memories that are painful. These experiences are, so to speak, put aside, pushed into a dark corner, into the obscure regions of consciousness outside of the focus of the bright light of attention. To be technical, they are repressed. If repression has been accomplished, however, it is not without a certain cost. These experiences, crowded out of clear consciousness, out of the possibility of synthesis with the rest of the personality, begin to lead a quasi-independent existence. They constitute what have been called submerged complexes* which may be briefly defined as groups of ideas constellated about a central painful event and cemented together by the painful affect of that event.

The complex, crowded out of relation with the personal consciousness, seeks for expression and because it is not synthetized with the rest of consciousness, because the individual is not aware of its existence, its expression can not be controlled and guided into the usual channels and so creates the symptoms of the psychoneurosis. One of my patients suffered from accesses of anxiety and fear without apparent cause. A short time before her husband had been on a "spree" and one night got up about two o'clock to go out. His wife was frightened for fear in his condition he would associate with lewd women. The thought was so hateful and painful to her, however, that it was crowded out of consciousness. The detached emotion continued to manifest itself even though the reason for it was not permitted to enter her mind.

This is a relatively simple example but shows quite well that the feelings of fear this patient had and which prompted her to throw herself out of the window could not have been reached by suggestion. The mechanism on which they were dependent must first be uncovered before there was any hope of dealing adequately with the situation.

The extreme difficulty in locating and uncovering the complex is due to the symbolic form in which it usually manifests itself. The painful

*White: The Theory of the "Complex," *Interstate Medical Journal*, April, 1909.

memories of disagreeable experiences, unethical, unconventional, and otherwise impossible and hateful wishes, while crowded out of mind by what Freud has so aptly termed "the censor of consciousness," nevertheless struggle to find expression. The complex cries for recognition, the censor will have none of it—the fight is on, the conflict wages, until finally a sort of compromise is reached by permitting the complex to come into clear consciousness, but only on pain of not disclosing its true self, under the cloak of a complete disguise.

For example Freud's case of Elisabeth.* She was engaged in nursing her sick father who afterwards died. One evening, spent away from home at the solicitation of her family, she met a young man of whom she was very fond and he accompanied her back home. On the walk home she quite gave herself up to the happiness of the occasion and walked along oblivious of her duties. On reaching home she found her father much worse and bitterly reproached herself for forgetting him in her own pleasure. She immediately repressed this disagreeable thought from her consciousness. Now she had, each morning, to change the dressings on her father's swollen leg. To do this she took his leg upon her right thigh. The suppressed complex seized upon the feeling of weight and pain of her father's leg upon her thigh as a handy and efficient means of expression and so the repressed erotic wish comes into consciousness under the disguise of a painful area of the right thigh corresponding in extent and location to the place upon which she rested her father's leg.

From the situation as presented thus far two problems are immediately suggested. First, of course, the therapeutic problem; and secondly, the problem of uncovering the submerged complex, of discovering the hidden mechanisms of the psychoneurotic symptoms. They are the problems of psychotherapy and of psycho-analysis. Let us take the latter first.

When we have a case that we have decided to try psycho-analysis with, the first thing to do is to have a detailed talk with the patient, covering the manifestations of the disorder and also touching the main events of the entire life as far as possible. We must remember that the symptoms with which we have to deal are only end-products—the results, perhaps, of a mechanism that seems fairly simple, but in the last analysis they are results made possible by all that has gone before—the entire psychic life of the individual. Our initial talk, therefore, serves not only to give us an account of the symptoms but to orient us with regard to the general make-up of the personality with which we have to deal.

During the course of this conversation it is inevitable that certain points will stand out as being important to pursue further. Here begins the real problem of psycho-analysis.

*Freud. Selected Papers on Hysteria and Other Psychoneuroses. Jour. of Nerv. and Ment. Dis. Monograph Series, No. 4.

The method of procedure, the so-called method of free association is roughly as follows: The patient needs to be alone with the physician in a room as far as possible from distracting influences—noises, bright lights, etc. To this end, too, the patient should be disposed as comfortably as possible so that physical discomfort or uneasiness will not interfere. It is well to have the eyes closed also, so that distractions from the visual field may be eliminated as far as possible. This general state of quiescence, and passivity can be enhanced by having him observe some monotonous sensory stimulus that dominates the sensorium and shuts out less insistent and inconsiderable sensations, such as the buzzing of a faradic coil. In this condition the particular feature of the history that it is desired to pursue further is presented to the patient, and he is asked to hold that event before his mind, to make no mental effort of any sort, such, for instance, as trying to remember, but to tell absolutely every thought that comes to his mind, no matter how fleeting, no matter how inconsequential it may seem or no matter how little bearing it may appear to have on the question at issue.

The theory of this procedure is that if the patient does not direct the thought in any way, every idea that comes must of necessity have some relation to the event held before the mind about which enlightenment is sought. The monotonous sensory conditions are observed to prevent distracting influence from outside sources. The directions to the patient, if carried out, prevent distractions from inside sources.

It is difficult to secure this condition of passivity in many cases, especially those who have never consciously used their minds and therefore do not know how to comply with the directions. It is difficult to get the patients to tell all the ideas that come. They naturally refrain from mentioning those that appear to be entirely fortuitous and to have nothing to do with the case. It will be seen from the theory, however, that these ideas cannot be unimportant, and that they must bear some relation to the central event.

This is the method of attack to fill out the information acquired in the initial conversation. The symptoms should all be dealt with in this way for the purpose of uncovering the submerged complexes and disclosing their mechanisms. As we proceed new events will constantly be brought to light that must also be pursued, as must also all the significant events of the patient's life.

Nothing is too trivial to be worthy of analysis, nothing but may throw light upon the situation. All the little slips of the tongue, forgotten incidents, points at which two recitals of an occurrence do not agree, even witticisms are necessary to trace out, while the dream life offers an abundance of rich material for study. Let me give an example from a case I have been recently studying. A young lady, refined, educated, and modest, entered a ball-room at a country club, from the piazza where she had been strolling with a gentleman with whom she was in love. She

wore a brilliant diamond star at her breast. A gentleman stepped up to her and admired the star whereupon she said "Yes, the stars are always brightest in the milky way." Immediately realizing what she had said she retired, confused and blushing and filled with apprehension as to what the gentleman would think of her. Analysis of this *gaucherie* showed that while walking on the piazza with her lover they had been observing the stars. They had picked out the big and little dipper and she had remarked that the stars were brighter in the milky way. Meanwhile a popular song was being played "Love Me Only," and her lover told her that her eyes were the only two bright stars in the world for him. She was frequently told she had bright eyes and now thinks of herself at this period of her life as having had bright eyes. Incidentally she knew how to use them. She was wearing a diamond ring given her by her lover on her birthday. She evidently regarded it as an engagement ring for she wore it on the engagement finger. She told him the ring reminded her of a star. He told her that she was so good and kind that she would have a good many stars in her crown. At this point I tried free association, and she told me of a time when a friend had written her destiny to be opened ten years afterwards and read. This destiny pictured her at twenty-six with three children, the youngest a bright blue-eyed baby. She recalls also that her lover wrote a poem to her called "My Star." It is significant that her lover had bright blue eyes, that she always associated blue eyes with him, that she dreamt of blue-eyed children, that once when holding the blue-eyed baby of a neighbor her lover had said to her "You make a pretty picture. Blue-eyed babies are becoming to you." It is also significant that in the word associations her reaction to the word "sky" was very long, 4.6", the preceding reaction being 4" long, because it evidently was significant, while the subsequent association which was evidently indifferent was 3". Her response to the word "sky" was "beautiful blue" and on repetition, "blue, sunny blue sky."

		<i>Reaction.</i>	<i>Reproduction.</i>
Dog,	3.	Pet I had once.	+
To talk,	3.2	I've always loved to talk.	+
Carriage,	4.	Carriage at home.	+
Sky,	4.6	Beautiful blue.	Blue, sunny blue sky.
Straw,	3.	Hay.	+

No matter which way we turn we are confronted by love, marriage, bright eyes and blue-eyed babies. I think the explanation is fairly apparent. It meant a wish, condealed in the remark, to belong to her lover and to have beautiful, bright, blue-eyed babies of his at her breast.

We must never forget, too, to investigate the dream life. Freud has shown that the mechanism of dreams is quite the same as that of the symptoms, so we may expect to get valuable information from this realm. The method of procedure is the same. The patient quite likely will deny dreaming at all at first but pursuit of the inquiry may very well disclose a rich dream life. The dreams are especially valuable and often throw a

great deal of light on the situation. To illustrate from the same patient: She told me she dreamt she was standing by the edge of a precipice, a man came along and pushed her off, at the base of the cliff was a mass of writhing serpents, just as she was about to fall among them she screamed and awoke. The impression was created on listening to her tell of this dream that she had been much frightened at being pushed from the cliff. This, however, was but the elaboration of the waking consciousness. She was not frightened to any extent. The analysis shows why. The cliff was familiar to her as being a place she frequently visited. Standing on the edge of the cliff was symbolic of a social and moral danger. She had never seen her lover since she had married and had wondered, if she were thrown with him, if he would try and tempt her. The man who pushed her off the cliff was her lover and the falling down really representing a moral fall, did not really frighten her very much, but was rather pleasant as it involved his companionship. As she nears the bottom, however, she sees the den of serpents. The serpent for her represents sin and recalls the sin in the Garden of Eden. Her fall has been pleasant until she sees its end in sin. This end is so hateful to her that she can not even permit the idea to enter her thoughts. The censor of consciousness, lulled by sleep, has permitted this symbolic wish-fulfilling play to go on up to this point, but now he must be aroused to full activity and press back to the furthest and darkest recesses even the suggestion of a sinful denouement. The patient awakes. See how full of information such a dream is of the innermost thoughts, inclinations, and desires.

This is the method of unraveling the tangled network of mental life. It takes weeks, months, perhaps years of constant effort. There is no royal road, no short cut to results. What it has taken a life time to produce can not be laid aside in an hour. How different a conception dominates this method of procedure from that of the method of suggestion.

At times in the course of the analysis it seems as though no further progress were possible. At these points, and perhaps also to start with, just after the initial conversation, it is well to try some word associations. This is done by taking the reactions to a list* of say one hundred words carefully chosen to cover the ordinary field of the average person's possibilities of complex formation. There may be distributed through this list words that for some reason may be supposed to have significance.

The method of procedure is to read the words to the patient instructing him to answer immediately the first word or thought that comes to his mind after hearing the word read, and recording the time it takes for this reaction. The most practical way for recording the time is by a stopwatch graduated to fifths of a second. After the list has been com-

*For such a list see White: *Outlines of Psychiatry*. Jour. of Nerv. and Ment. Dis. Monograph Series, No. 1.

pleted it is repeated in the same way, the time need not be recorded, however. The patient is asked to repeat the same associations he gave the first time if he can recall them.

When one of the words in the list touches a complex, is a complex indicator, a marked disturbance in the reaction is noted. This disturbance shows in several ways: peculiarity of the type of reaction; increased length of reaction time; irradiation of the disturbance to the next one or two associations; and failure to repeat the same association. I have already given some illustrations. I will add another at this point. The association to the word "wagon" in the same patient I have been giving illustrations from, was "wagon, many I see on street," but took 11.8". Free association disclosed an escape from a sanatorium and a drive in a wagon, which she had come up with on the road, to her friends. Another patient I casually gave a few words to. Knowing that her mental break-down was associated with the stealing of jewelry by her nephew, I included the word "pin." She could not reply but said she could if the word were medal. She then flushed, began to cry, and detailed an incident when her sister had left a medal in her room and upon returning discovered it was missing. It was quite evident that her nephew had stolen it. She had never told of this incident although repeatedly questioned with a view to discovering all the things of importance in her history. Both of these instances illustrate the uncovering of events in the lives of patients, which although in these particular examples might not have been of much importance, still would probably never have been brought out by ordinary questioning. This method is valuable then for with it we may find some unexpected complex or some new line of inquiry, that we can continue with to advantage.

It will probably occur to many to wonder how it is that we can expect to find memories reaching back for years sufficiently well preserved to be helpful. As a matter of fact the memories of all repressed experiences are perfectly clear, no matter how old. The explanation for this is that being repressed they are dissociated from the every-day events of life, they are kept in their original form, they have not been subjected to the attrition and amalgamation with the intricacies of associational life. They do not fade out by this process of absorption as do the memories of indifferent events, but remain where ever after they may be brought to light by analysis and used as helps for cure.

Thus we have three main inquiries, three avenues of approach to our psychoneurotic patient—word association, free association, and the analysis of dreams. With these at our disposal possibilities, heretofore little expected, open up.

You will see from this short description what a far-reaching method this is. A method of analysis from which no event of life, no matter how apparently trivial, is free. A method that in its results lays bare not only the immediate antecedents and causes of the symptoms, but the whole

innermost life of the patient reaching back even to the period of early childhood. This, of course, takes time. A case of any complexity and difficulty quite generally takes several months, of at least two or three sittings each week, to reach a final result.

The element of time is an important one for more than one reason. In the first place, it may, and does, largely preclude the possibility of the general use of this method by the average practitioner. It should not, however, lead to adverse and destructive criticism of the method for that reason alone, as it has done in some instances. If the psychology upon which the method is based is true, we must of necessity accept it whether it meets with our convenience or not. Then it is rather silly after all to have a scientific position condemned because to carry out the resulting methods takes too much time. An effort might legitimately be made to improve upon the method, but truth does not yield to attack based upon such principles.

There is some reason to believe, however, that the time needed to effect lasting results in this class of cases cannot be materially shortened. These cases come to us in a sea of trouble, tossing about blindly, and hopelessly, on the waves of emotion, far from shore and safety, resigned often to a life of suffering, desperate often at seeing no hope of release, but quite unable to help themselves at all. Of course, in the nature of the case, the real troubles—the buried complexes—not only are not known by the patient, but they cannot be known, and the obvious explanations for the symptoms that the patient often has ready at hand, not only are not the real explanations but they cannot be. Nevertheless, the original repressions and the dissociations in consciousness resulting are quite characteristically due to a false attitude towards the problems of life. The young woman, in love with some one of whom the father disapproves, may have a fleeting thought that the father's death would straighten matters out and enable her to marry without further opposition. Now, instead of reacting to such a thought naturally, by realizing that as a conscious human being such a thought was merely an expression of her wish to marry the man she loved, by the expression of a natural desire that the obstacles in the way be removed, and putting it quietly and without passion aside as impossible of consideration because of its unethical character, in fact unworthy of even contemplation, she becomes terribly horrified that such a thought could even find entrance to her mind and represses it immediately as not only too horrible for consideration, but with a sense of chagrin, shame, and self-reproach. Such a putting aside, side-tracking of a disagreeable thought, such a refusal to meet an unwelcome guest in the open, frankly, such a refusal even to see the disagreeable does not make for efficient reaction, does not enable the individual adequately to adjust.

These patients come to us with no adequate philosophy of life, no raft with which they can safely reach shore in their sea of trouble. They

have narrow, distorted, perverted viewpoints, and these it is necessary fully to appreciate in the course of the analysis, for these must be corrected. They cannot be corrected by a pronunciamiento, by laying down what the analyzer believes to be the law and the gospel on the different questions involved, but must be slowly changed by a process of re-education in which the personality of the physician and his attitude towards the whole situation plays a prominent part. And herein lies the importance of the element of time.

This re-education of the patient is dependent perhaps more upon the attitude of the physician than upon any particular thing he may say. The personality of the physician plays a certain rôle. Whereas, theoretically, his personality should be *nil* in its effects, if the method were accurate, still the method is not perfect and has to be carried out by human means. The patient, before the analysis has proceeded far, sees that to go on means to bare his very soul. One does not confess his innermost thoughts to everyone; the hysteric, for example, is not impelled to unburden himself of his story to the passer-by like the Ancient Mariner. Quite the contrary. The whole trend of his malady is toward concealment, repression. The personal characteristics of the physician do, I think, play some part, although I am willing to admit that this part is less in proportion to the perfection of the method.

Now as to the physician's attitude. In the first place his attitude should be one of absolute lack of critique. The physician is merely after facts, for by the analysis he hopes to help the patient by removing the symptoms. He will in the course of his analysis hear many intimate thoughts, learn of many wrong, perhaps disgusting or even criminal acts. He should express no surprise. They are but facts, that is all. The patient must not be blamed or laughed at. He has already done that for himself many times. In fact that is often the trouble. Self-blame may have been the cause for the original repression. His moral sense is already keen, in fact, perhaps, too keen, and an element of prudery or over-scrupulousness must be removed for a more healthy attitude of mind.

Sympathy is likewise not to be indulged in. The patient does not want it and it is not helpful. The attitude of the physician, however, has as an element the most important factor in sympathy—understanding. To be understood is indeed a privilege. For years the psychoneurotic has failed of being understood, has refrained from talking to persons about himself, perhaps, after one or two disagreeable experiences, for fear of being laughed at. In fact, he has failed to understand himself. Now to find some one who does understand—what a relief—and it is helpful in no small degree in the progress of the work.

The demands upon the physician are very great. Not only must he have no end of patience, and be able to give a great deal of time, but he must be constantly on the alert to grasp every clue and must be always resourceful in the face of the unexpected. For example, a woman suddenly

injects a query as to the sinfulness of preventing conception. Here is an opportunity for moral orthopedia to be grasped, it must not be allowed to slip by. It requires, however, full preparation, full preparedness. In the particular case I have in mind a great deal of the emotional depression hinged about this question. It was necessary to discuss it, but by no means was it easy to do so. A discussion of such a subject, if it is to be helpful, requires a viewpoint free from all narrowness, free from petty dogmatism, religious or otherwise, broad, comprehensive and above all humanistic.

I am reminded in this connection of a recent experience. A woman of education and refinement told me in the course of an examination of a sexual experience in early childhood. She never had told anyone else in her whole life about it and it was with the greatest difficulty she could bring herself to speak of it. When she had related it to me, however, I was able at once to correlate it with certain pre-nuptial practices carried out by the women of certain savage tribes, and indicated to her how this experience was an instinctive carrying out by children of practices that were well developed by savages. This correlation was helpful in enabling a discussion of the occurrence from a social standpoint and did much to rob the event of that disgust which is so frequent and disturbing an element in the recollection of such experiences.

It is these elements in the attitude of the physician—his lack of critique, and his understanding—that are the quiet determinants making through the weeks and months of psycho-analysis for a more wholesome, a more robust philosophy of life, and finally when all the submerged complexes and the mechanisms of the symptoms have been uncovered our patient emerges literally born again. The disordered material which the patient brought to us has, if we have been successful, been sorted over, re-arranged, added to, and built into a new and enduring structure. Such, in brief, are the theories, the methods, and the aims of psycho-analysis as a psychotherapeutic agent.

Government Hospital for the Insane.

THE INDICATIONS FOR AND A NEW TECHNIQUE PERTAINING TO THE OPERATIONS OF CECOSTOMY AND APPENDICOSTOMY IN THE TREATMENT OF INTESTINAL LESIONS.

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Cecostomy. Experience has demonstrated to the writer's satisfaction that cecostomy is preferable to appendicostomy in the direct treatment of intestinal disease, and at the June meeting (1909) of the American Proctologic Society* he took the position that with few exceptions the former should be substituted for the latter in this class of cases.

A comparative study of the advantages of cecostomy and the disadvantages of appendicostomy, as enumerated below, will show why the former should take preference over the latter.

Advantages of Cecostomy. The advantages of this operation and more especially the writer's cecostomy, which provides a means of irrigating both the large and small intestine, are as follows:

1. Owing to the fact that the cecum lies against the inner abdominal parietes, it can be easily anchored without angulating or twisting the bowel.
2. Since the opening is opposite the ileocecal valve, a catheter can be introduced into the small bowel for irrigating purposes or the siphoning of its contents for examination.
3. The cecal opening can be made of a suitable size.
4. The circular valve-like projection formed around the catheter by the infolding purse-string sutures prevents leakage.
5. The catheter can be changed without difficulty.
6. Closure of the opening follows withdrawal of the catheter and a few applications of the copper stick or cautery.
7. Owing to the natural position of the cecum, there is less tension and pain following its anchorage to the abdomen than occurs after appendicostomy.
8. Cecostomy (Gant's) may be employed in the treatment of lesions located anywhere in the intestinal canal, while appendicostomy is limited to those of the colon.

Disadvantages of Appendicostomy. 1. The appendix is more difficult to bring up for anchorage than the cecum because of its deeper and more

*Gant: Surgical Treatment of Diarrhea with a Description of a New Cecostomy which Permits Free Irrigation of Both the Small and Large Intestine. *Medical Record*, September 11, 1909.

uncertain position and because it is frequently bound down by adhesions or a short mesentery.

2. Anchoring of the appendix causes angulation or twisting of the cecum which, in turn, may induce constipation, discomfort, or pain.

3. When the cecum about the appendiceal base is caught in the wound, it induces nausea and vomiting until detached (author's case).

4. When the appendix is small, short, strictured, bound down by adhesions, blocked, or is otherwise diseased, it is useless for irrigating purposes.

5. Irrigation is frequently difficult and unsatisfactory because of the small appendiceal outlet.

6. Pain following appendicostomy is much greater than after cecostomy owing to the pulling upon the appendix by the loaded cecum, the peri-appendiceal adhesions, or the squeezing of the attached mesentery when the wound is closed tightly about it.

7. Frequent dilation or the insertion of a catheter is often necessary to keep the opening sufficiently large.

8. Death has followed injection of the irrigating fluid into the abdomen beside the appendix, where an interne mistook an opening in the wound for that of the appendix (author's case).

9. After a cure it is more difficult to close the appendiceal than the cecal outlet, and appendectomy may be necessary.

10. Appendicostomy frequently fails because the appendix slips back into the abdomen or retracts sufficiently to make irrigation almost or quite impossible.

11. The appendix has been known to slough off several times owing to tension, its constriction by the sutures or destruction of its blood supply making cecostomy imperative.

12. Appendicostomy is not effective when the disease is located in the small intestine.

13. Appendicitis requiring appendectomy following closure of the appendiceal outlet has occurred (author's case).

14. Owing to the irritation caused by the catheter or treatment the mucosa may become so inflamed and swollen, ulcerated or strictured, that irrigation must be abandoned.

15. According to Reed,* the catheter causes the wall of the appendix frequently to perish.

16. Finally the appendix may become blocked by an angulation (author's stab-wound appendicostomy).

Gant's Cecostomy with an Arrangement for Irrigating both the Small Intestine and Colon. The writer will now describe an original way of flushing both the small and large bowel through the same opening in the cecum—an operation which, for want of a better name, he has designated

*Reed: Some Therapeutic Adaptations of Cecostomy and Appendicostomy. *Jour. Am. Med. Ass.*, March 5, 1910.

"Cecostomy With an Arrangement for Irrigating Both the Small Intestine and Colon."

He believes his cecostomy is superior to that of Gibson because the technique is equally simple, the operation requires no more time, there is less leakage owing to the purse-string infolding being substituted for his lateral sutures, both the small and large bowel can be irrigated by the attendant or patient, a firmer union is obtained by attaching the cecum to the transversalis fascia than to the parietal peritoneum, and the opening heals spontaneously after the catheters are removed.

The following briefly-described steps of the author's cecostomy can be readily grasped by a glance at the accompanying illustrations:

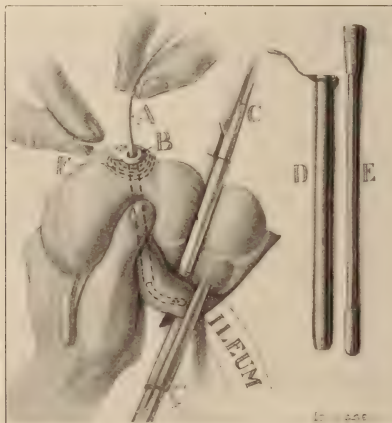


Fig. 1. First steps in Gant's Older Cecostomy, with an arrangement for irrigating the small intestines.

- (a) Catheter being introduced into the small bowel.
- (b) Catheter guide *in situ* through which it passes.
- (c) Intestinal clamps.
- (d) Side view of catheter guide and
- (e) Obturator from the same.

First Step. Through a two-inch intermuscular incision made directly over the cecum, it and the lowermost part of the ileum are withdrawn and the edges of the wound covered with gauze handkerchiefs.

Second Step. The anterior surface of the cecum is scarified after the ascending colon and ileum have been clamped to prevent soiling of the wound when the bowel is opened (Fig. 1).

Third Step. Four linen seromuscular purse-string sutures are introduced into the anterior wall of the cecum opposite the ileocecal valve (Fig. 1) and the bowel is opened inside the suture line.

Fourth Step. The gut is grasped at the juncture of the large and small intestine and held in such a way that the ileocecal valve rests between the thumb and fingers of the left hand (Fig. 1). A Gant catheter carrier guide (Fig. D) is then passed directly across the cecum and through the ileocecal valve into the small intestine aided by the thumb and fingers (Fig. 1, B, D and E).

Fifth Step. The obturator is removed from the guide and a catheter is introduced into the small bowel (Fig. 1, A), and held there by an as-

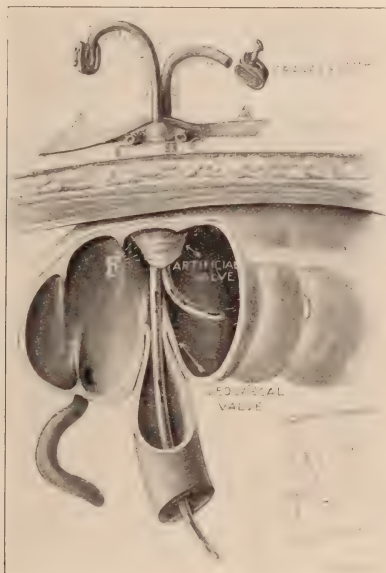


Fig. 2. Final steps in Gant's Older Cecostomy, with an arrangement for irrigating the small bowel.

- (a) and (b) Adhesive strips which retain the catheters in place.
 - (c) Tubings across which the suspensory sutures shown in the small drawing are tied.
 - (f) Projecting circular valve formed by the infolding purse-string sutures.
- Large white arrow indicates ileocecal valve. Black arrows indicate the direction of water-flow into the large and small bowel.

sistant until anchored to the cecum by catgut sutures to prevent its slipping out during the operation.

Sixth Step. A short rubber tube three inches long is projected into the

cecum for an inch or more and anchored beside the one projecting into the small gut (Fig. 2).

Seventh Step. The infolding purse-string sutures are now tied forming a cone-shaped valve about the catheters to prevent leakage of gas and feces.

Eighth Step. After removal of the clamps, the cecum is scarified and anchored to the transversalis fascia, denuded of its peritoneum by through and through linen suspension stitches.

Ninth Step. The suspension sutures are tied across rubber tubings (Fig. 2, C), the wound is closed by the layer method, and the catheters are fastened by stitching or by encircling them with an adhesive strip (Fig. 2, B) to hold them together and crossing this at a right angle with a second piece of plaster placed between the pipes (Fig. 2, A), to prevent their slipping out.

Tenth Step. The ends of the catheters are closed with cravat clamps (Fig. 2) to prevent leakage and the operation is completed by applying the dressings about the projecting tubes.

One catheter is left longer than the other or is identified in some way, in order that the interne or nurse may know *which is in the large* and *which in the small intestine* when time for irrigation arrives. To avoid danger from infection, treatment is not begun before the fifth day except when urgent.

The catheters may be quickly changed by cutting the attached adhesive strips and withdrawing the one projecting into the cecum. The catheter guide is then passed over the other into the small intestine where it is retained until the old tube has been removed and a new one introduced. A second piece of catheter is then placed in the cecum and both are prevented from slipping out by adjusting fresh adhesive straps after the manner already described.

Before deciding upon the above technique, the writer irrigated the small intestine by passing a glass or silver catheter through the cecal opening into the small gut for each irrigation, but this practice was abandoned as impractical, because of the difficulty encountered in locating and passing the valve, and, further, because the patient could not irrigate himself.

The writer has had no reason to suspect that peristalsis has forced the catheter out of the small intestine, except in his first cecostomy where the tube was soft, cut short and projected only one inch beyond the ileocecal valve instead of several. He feels confident that the catheter remained in the small gut in his other cases because (a) water injected through the colonic pipe was evacuated quicker than when it was deposited in the small bowel; (b) when a minute quantity of a 10 per cent. solution of methylene-blue was injected into the former, it appeared in the urine more quickly than when introduced into the small gut; (c) the catheter guide could be carried over the tube in the small intestine and

the latter could be removed and replaced at will; and, further, (d) fluid feces could be withdrawn more quickly and frequently through the pipe in the small intestine than through the colonic catheter.

To avoid possible expulsion of the catheter from the ileum the writer, on different occasions, successfully employed catheters made of silk, silver, glass, and soft rubber reinforced by an inner metal tubing which could not be forced out of the bowel, owing to their nonflexibility. Only that portion of the pipe projecting into the small bowel was reinforced as the rubber catheter served the desired purpose because it induced but little irritation owing to its softness and flexibility.

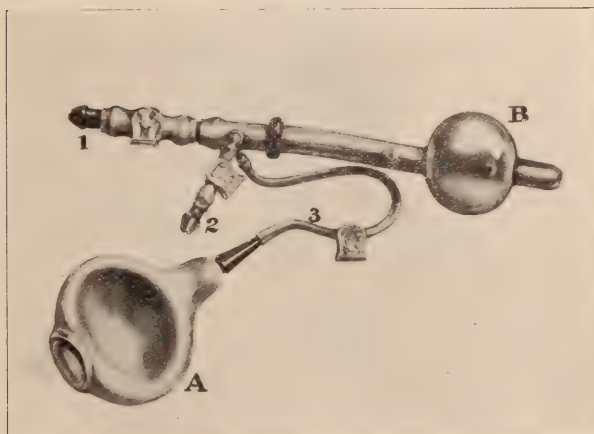


Fig. 3. Gant's Rubber Enterocolonic Irrigator.

(a) Bulb for closing up inflating-bag.

(b) Inflating-bag.

1. Tube through which the irrigating fluid reaches the small intestine.

2. Tube connecting with the colonic irrigator.

3. Inflating-tube.

The movable hard rubber ring is used to measure the distance to the ileocecal valve, which varies in thin and stout people.

The various pipes are seen closed by five-cent cravat clamps.

Gant's Enterocolonic Irrigator. The author at the Cleveland (Ohio) Academy of Medicine, November 19, 1909, exhibited and described the new enterocolonic irrigator (Fig. 3), which he will now pass for your inspection: an instrument successfully employed by him several times in the direct treatment of intestinal affections involving both the small and large bowels.

This instrument is made both of rubber and metal, has worked exceedingly well in the cases in which it has been used and is self-explanatory when compared with the accompanying illustrations.

When the irrigator is in position, the inflating bag (Fig. 3, B) lies in the small intestine at or near the ileocecal valve (Fig. 4, D), and when

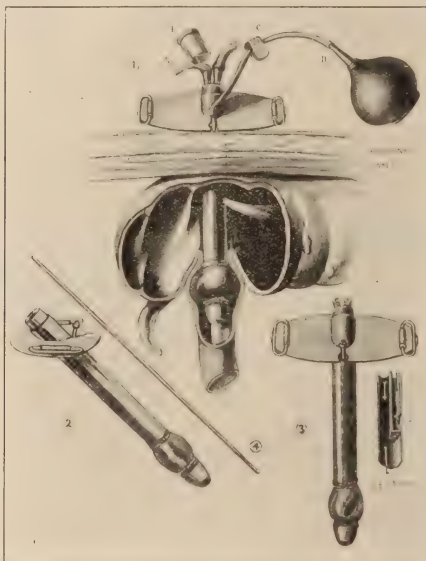


Fig. 4. Steps showing Gant's Newer Cecostomy, which provides for irrigation of both the small and large intestines.

1. Shows apparatus in position.
2. Side view of Gant's metal enterocolonic irrigator.
3. Front and sectional view of the same.
4. Celluloid guide employed in removing and re-introducing the irrigator for cleansing and repairing.
 - (a) Irrigating tubes.
 - (b) Inflating attachment.
 - (c) Clip for closing same.
 - (d) Cover for irrigator.
 - (e) Shows inflating bag distended with air to prevent return of the solution into the rectum.

distended fills the bowel and prevents escape of the solution into the cecum, thereby enabling the attendant accurately to gauge the amount of fluid deposited in the small bowel and to retain it there as long as required. By means of this twin-tube irrigator, the small and large

intestines can be quickly and scientifically flushed, singly or together, by the physician, nurse, or patient.

The steps in the writer's cecostomy, when the irrigator is employed, are similar to those already described when catheters are used, except that the Gant catheter guide is unnecessary and the apparatus is retained in position by attached pieces of tape which encircle the body, or by adhesive strips.

Indications for the Author's Cecostomy with Provision for Small and Large Bowel Irrigation. In a paper* read before the Medical Association of Greater New York, April 30th, 1908, and since, the author has called attention to the fact that his cecostomy is indicated in the treatment of intestinal parasites, enteritis, enterocolitis, peritonitis, paralytic ileus, intussusception, catarrhal, tuberculous, syphilitic, dysenteric and gonorrheal colitis, ordinary and pernicious anemia; in the many manifestations dependent upon intestinal auto-intoxication, ptomain poisoning, diarrhea of adults and children, intestinal feeding, malnutrition and following operations upon the mouth, throat, esophagus or stomach, in gastric stricture, ulcer, cancer and other disturbances where rest of the organ is indicated. Again, he has claimed that by means of his cecostomy, various intestinal diseases could be investigated, and that the procedure could be used to determine the amount and nature of the intestinal juices and discharges, the character of the feces, the action of salines and other cathartics injected directly into the small and large bowels, the marked immediate vasomotor effect following hot and cold enteroclysis, the introduction of bacteria for therapeutic purposes, the injection of a bismuth solution into the intestine for x-ray diagnosis; and in the study of many other interesting problems. In closing the discussion of the above-mentioned paper, the author reported several cases successfully treated by his operation and stated that, while he had had experience with it in the treatment of cholera and typhoid fever, he believed that it was indicated and in the future would be used in the treatment of these and nearly if not all other non-obstructing diseases of the small and large bowels.

In his work on "Constipation and Intestinal Obstruction," published in January, 1909, the author pointed out the usefulness of cecostomy as a means of drainage when the cecum or another part of the colon was excluded. He has also employed cecostomy a number of times when operating for mechanical constipation, where colitis was a complication, and also in the palliative treatment of obstipation, where the patient declined to have the cause of the obstruction removed and yet suffered from deplorable auto-intoxication or recurring impaction.

Gant's Appendicostomy with Exhibition of a New Appendiceal Irrigator. Some surgeons do not open the appendix during the operation

*Gant: Local and Surgical Treatment of Chronic Diarrhea with a Description of a New Operation for Irrigating the Large and Small Intestine. *New York Medical Jour.*, August 15, 1908.

because they fear infection. This practice the author believes is bad, except when it is obvious that the appendix is unobstructed, because he has encountered three failures following it. In one, the appendix was too small, in another it was strictured, and in still another it was blocked by an encysted grape-seed.

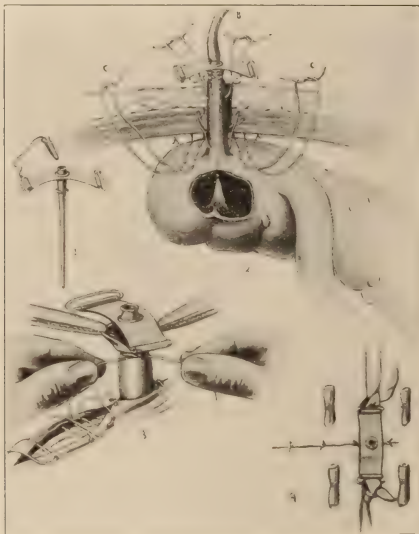


Fig. 5. Steps showing Gant's Appendicostomy, which provides for immediate irrigation in the direct treatment of Bowel Diseases.

1. Gant's appendiceal irrigator.
2. Cecum and appendix in position.
3. Method of ligating the appendix about the projecting rim of irrigator and closure of the wound.
4. Shows the irrigator in place and the attached pieces of tape which pass around the body, and retain it in place when tied, and also the rubber tube across which the suspensory stitches CC are tied.
 - (a) Shows peritoneum removed and the gut being brought in contact with the transversalis fascia.
 - (b) Tube attached to irrigator.
 - (c) Suspensory sutures which attach the scarified cecum to the abdominal wall.

The writer amputates the appendix and immediately introduces his probe-pointed appendiceal irrigator; then he knows nothing can interfere with post-operative irrigation, but when the appendix is diseased, it is

removed and cecostomy is performed. It is important that irrigation be started at once in patients suffering from ulcerative colitis who are despondent, greatly debilitated, have many movements, lose considerable blood, or suffer from insomnia and auto-intoxication.

To meet these conditions the writer has devised a technique for appendicostomy which provides for irrigation both during and following operation (Fig. 5), since the adoption of which his patients have gained very much more rapidly than formerly, when the appendix was not opened for several days during which time nothing was done to relieve them. Now and then a stitch abscess has occurred but other complications have not arisen during or following operation, and the pressure of the irrigator has not caused the appendix to atrophy or slough.

Briefly described the following are the steps in appendicostomy as performed by the author:

First Step. The appendix is approached through a gridiron incision and located by tracing the anterior longitudinal band downwards, when it and the cecum are freed, brought outside, and the wound protected with gauze handkerchiefs.

Second Step. The cecum is drawn first to one side and then the other by an assistant while the parietal peritoneum is removed at the sides of the incision to insure union between the gut and the transversalis fascia.

Third Step. The appendix is freed and straightened by ligating and dividing adhesions and the mesentery at a safe distance from it, but when the appendix is free the mesentery is not disturbed.

Fourth Step. After the cecum has been scarified, two seromuscular suspensory sutures are introduced into it at the sides and near the base of the appendix, each taking three bites in the gut.

Fifth Step. By means of a long-handled needle, the anchoring stitches are carried through the abdominal wall and clamped with forceps for identification.

Sixth Step. Having surrounded the appendix with gauze, a traction suture is introduced to steady it while its end is being amputated and cauterized.

Seventh Step. A Gant probe-pointed appendiceal irrigator closed with a stopper is introduced and the appendix is ligated around it above the projecting rim.

Eighth Step. The appendix is placed in the lower angle of the wound pointing upwards and anchored by two gut sutures which pass through the transversalis fascia.

Ninth Step. The abdominal layers are then approximated separately, after which the cecal suspensory sutures are tied across rubber tubes.

Tenth Step. The irrigator is prevented from slipping out by the adjustment of adhesive straps or by means of attached pieces of tape which encircle the body.

Eleventh Step. In urgent cases, from one to three pints of a warm saline solution are immediately injected into the colon, when the irrigator stopper is introduced to prevent leakage.

Twelfth Step. The wound is sealed by means of cotton and collodion and is protected further by rubber-covered split gauze pads which overlap each other when placed about the appendix.

Thirteenth Step. The end of the irrigator is surrounded by twisted gauze strips to prevent pressure upon it when the outer dressings are applied.

Number of Operations Performed. Thus far the author has employed the direct treatment or through and through irrigation one hundred and five times in adults and three times in children for the relief of intestinal affections alone, or complicated by other ailments. The subjoined table of cases fully explains the number and nature of the operations performed and the relative frequency in which direct treatment was employed in the different diseases.

TABLE SHOWING OPERATIONS AND AFFECTIONS FOR WHICH DIRECT BOWEL TREATMENT WAS EMPLOYED BY THE AUTHOR IN ONE HUNDRED AND FIVE ADULTS.

OPERATIONS PERFORMED FOR	Colitis	Intestinal Exclusion	Potomaine Poisoning	Chronic Fecal Impaction	Hirsch Sprung's Disease	Chronic Dilatation of Colon	Clonic Ptosis	Multiple Polyps of Colon and Rectum	Ulcerative Lesions, complicating chronic constipation of the sigmoid flexure operated upon by colopexy and sigmoidopexy	TOTAL
Appendicostomy	48	4	1	2	1	2	1	0	4	63
Appendico-Cecostomy	4	0	0	0	0	0	0	0	2	6
Gibson's Operation	6	2	0	2	0	1	0	2	1	14
Author's Cecostomy	19	1	1	0	0	0	0	0	1	22
Number	77	7	2	4	1	3	1	2	8	105

Following through and through irrigation, the condition of the patient improves rapidly, and manifestations such as anemia and others induced by auto-intoxication rapidly disappear, and in cases of diarrhea, the frequency of the stools greatly diminish and the amount of blood, pus and mucus passed soon becomes markedly less.

The good results following the direct treatment are due mainly to the mechanical action of the fluid in cleansing and stimulating the ulcers and removing retained toxins and not altogether to its temperature or chemical contents. Solutions should be employed warm because of the soothing effect heat has upon the bowel, and not cold, because when employed ice cold they excite enterospasm and cause much unnecessary suffering.

Briefly stated, the most reliable, stimulating, and soothing remedies to employ are weak solutions of boracic acid, ichthyol, quinine, permanganate of potash, creolin, formalin, hydrastis, nitrate of silver, krameria, soda, and those of a soothing nature—kerosene, liquid paraffin or olive oil, according to indications. The stimulating solutions are used stronger when ulceration is extensive and the oils warmed when the gut is irritable.

In conclusion the writer cannot refrain from emphasizing once again the great value of cecostomy in the direct treatment of intestinal ailments, nor from making a plea for its more frequent employment in the future.

150 East Thirty-fifth Street.

FACTORS THAT SHAPE THE SUCCESSFUL TREATMENT OF
NERVOUS DISEASES.

By JOSEPH COLLINS, M. D., of New York,
Physician to the Neurological Institute.

The treatment of nervous diseases is usually considered by the average practitioner to be the cultivation of a barren acre. Even specialists in neurology have been accused, no doubt with some justice, of devoting less time to the therapy of the diseases that they encounter than to the diagnosis. The adequate treatment of the majority of nervous diseases is not encompassed by the administration of medicines, regulation of the diet, or even by conforming to the laws of Hygeia; hence it is that so many of them are inadequately treated. It is not the fault of the practitioner. He has neither facilities nor equipment for carrying out the treatment that is appropriate and adequate; therefore these patients become recruits for the Eddyite, the Emmanuelite and the quack, or the habitués of the "cures" and commercial sanatoriums of Europe.

The first essential for the successful treatment of any disease is a correct diagnosis; the second is a full recognition of the source from which the disease has flowed; and the third is a clear conception of what we desire to accomplish. Given this information, curable nervous diseases may be shaped toward recovery by such physical measures as rest, occupation, and exercise; by water, electricity and massage; by exhortation, persuasion and explanation; and by medicines.

To study them properly, to diagnosticate them correctly, to treat them successfully, often requires the equipment of a modern hospital; and the chief reason why so many nervous diseases are not satisfactorily treated is that until the founding of the Neurological Institute in New York, we had no hospital in this country to which a person afflicted with nervous disease and with mental disorder, which does not amount to real insanity in the ordinary sense of the word, could go. Our general hospitals have not welcomed them, and, even if they had, no provision was made in them for proper treatment.

Granting that the doors of general hospitals were open to patients suffering with nervous disease, it would be difficult to conceive of a place less adapted for their treatment. Such patients are extremely suggestible, and the familiar sight of the general ward, a patient in the agony of death or evidencing the suffering of painful disease, is profoundly detrimental to them.

Patients afflicted with nervous diseases that jeopardize their livelihood, curtail their usefulness, destroy their happiness, have in many instances

the appearance of health. They do not show their disease in their features, as does the sufferer from bodily disease. Many of them are able so to cloak their sufferings and unhappiness that they do not betray their disorder even in their conduct; but those who come into familiar contact with them—their families, their intimates and their physicians—know that the suffering which many of them undergo is not paralleled by bodily suffering.

They are as deserving of treatment as the patient who has typhoid fever or pneumonia, or other self-limiting disease. These functional disorders of the mind are not self-limiting; they tend to become more dominant, until finally they control the victim imperiously. When such patients can avail themselves of the skill of neurologists and of nurses, when they can have houses apart from their families in which plans of treatment can be carried out, when they are so provided with material aid that they can follow the sun, so as always to have warmth and sunshine and life in the open, many of them recover. But what becomes of the poor, the wage-earner, the support of the family, afflicted similarly? What do they do when they begin to get fatigued without cause, sleepless, apprehensive, self-concerned, fearful, obsessed? They see their capacity for work gradually dwindling; they appreciate that they can no longer discharge their obligations to their employer; they realize that helplessness and ignominy is their doom. And what resources have they? What can they do?

In cities, they can go to the outdoor clinic of some hospital and there tell their stories to physicians who have five or ten minutes to devote to each patient and then receive a prescription for medicine which they do not need, and which will do them no good save as it props the assurance given by the physician that the patient will recover. There is no opportunity to study the patient's mental make-up; there is no facility for unraveling the complex mental and emotional states which accompany such condition; there is practically no chance for the physician to detect the underlying cause, of which the mental, emotional and physical states are but the expression. Assurance cures some of them, but assurance alone is not sufficient. They need instruction, how to live hygienically; they need orientation; they need to be taught how to think straight; they need to be shown how to pluck out fear, apprehension and obsession, and to put in their places courage, hope and confidence. They need to be taught that the possession of health stands in direct relationship to conformity to hygienic laws, and that these laws cannot be broken without entailing a penalty. They need to be taught that restoration of health is not to be obtained by taking medicine, but by availing themselves of rest, sleep, fresh air, food, exercise, baths, massage, and discipline. And finally, they need to have put before them, in a comprehensive way, the fact that mind controls body, and that our corporeal matter is subservient to the dominion of the will. These things cannot be done in dispensaries;

they cannot be done in general hospitals; they can only be done in hospitals that are properly equipped, not only with material things, but with doctors, nurses, trainers and social workers.

It is widely believed that nervous diseases, and particularly the so-called functional nervous diseases, are of commoner occurrence in this country than in any other. Whether or not this widespread belief is well founded, there is no denying the fact that this country has made little or no provision for the proper study of these diseases and for the adequate care of the poor who suffer from them. The early detection of nervous diseases and the interpretation of those mental conditions which incapacitate but do not constitute insanity; the study of the laws of heredity in their relation to the occurrence of these and other nervous diseases which stamp the individual with inadequacy; the study of the relationship of nervous diseases to nutritional states, to injury, physical and mental, we believe to be of the greatest import for the health and welfare of the community; and the only place where these can be accomplished is in the hospitals devoted to such work. With that end in view, and to provide for a place for the training of nurses and attendants for those afflicted with nervous diseases, Dr. Joseph Fraenkel, Dr. Pearce Bailey and myself have, with the coöperation of a number of public-spirited, generous and humane citizens, established in New York a public hospital called the Neurological Institute. Heretofore it has been almost impossible successfully to enter the ranks of the neurologist without a European training. The result of this is reflected in the indifference with which the subject of neurology is treated by the profession in general. We venture to believe that the Neurological Institute will, as soon as its purposes and facilities are generally known, be much sought after as a place where physicians can receive instruction how to pursue the study and interpretation of nervous diseases.

We venture the opinion also that the Neurological Institute will assist in developing a new type of specialized worker—namely, the trainer, who can be used to the greatest advantage by physicians and patients. The majority of patients suffering from nervous disease do not need trained nurses; they need the service of an individual who knows the principles underlying nutrition; who has had some training in practical dietetics; who can give a tonic bath, teach proper breathing, and knows the art of relaxation; who knows that a low voice and a placid exterior are inconsistent with a state of tension and panic; who realizes that the easiest way to stop thinking of a thing is to stop talking of it. One, in short, who can walk and run, and rub and stretch, and knead and play; one who can divert and distract; one who has some idea of the principles underlying concentration on the one hand and abstraction on the other; one who can inculcate such universally accepted truths as that which says that happiness has small relationship to material possession compared with the relationship that it has to mental and emotional poise; finally, one who can teach the point of view.

The hospital of the Neurological Institute has accommodations for eighty patients. Half of this number are accommodated in small wards, the other half in rooms with one or two beds. The therapeutic department is equipped with special appliances of every kind that have been found serviceable in the treatment of nervous, mental and metabolic diseases: a hydriatic room, a Zander apparatus room, a room for electricity, superheated air apparatus, rooms for electrotherapy, phototherapy, vibration, massage and Fraenkel movements, etc. In addition there is a large roof-garden and occupation-rooms in which modeling in clay, weaving, basket-making, wood-carving and brass-working are practised. All these departments are in charge of salaried experts.

The pathological laboratory, under the supervision of an experienced salaried chemist and pathologist, is fully equipped for chemical and microscopical examination of the blood, urine, feces, stomach-contents and pathological specimens. Serum diagnosis is a routine procedure for many of the patients in both hospital and dispensary.

The clinical laboratory is adjacent to this laboratory and to the wards. Here the physician takes the patient upon whom he desires to make extended or particular tests, such as require the use of delicately adjusted or complicated instruments, and especially for such investigations as blood-count, determination of opsonic indices, polygraphic tracings, tendon-jerk registrations, tonometric measurements, and the use of psychological apparatus.

The operating-room is equipped for all operations upon the nervous system and is in charge of a special operating-room nurse.

The hospital is manned by three attending physicians, six house physicians (three internes and three externes, all of whom are salaried), and three assistants. That is twelve physicians to care for eighty patients, and the out-patient department. In addition to this there is a large assistant staff in the out-patient department. Supplementing the staff of thirty-six nurses, we have four massage operators, two hydriatists and two assistants, one electrotherapist (a physician) and two assistants, a director of the Zander department, of the exercise department, of the Fraenkel department, and of the occupation department. All of these are experts.

During the six months that the hospital has been in operation upward of four hundred patients have been admitted to the wards and private rooms, and nearly two thousand patients have been examined in the dispensary. Seven patients have been operated on for spinal cord tumor, five for brain tumor, two laminectomies have been done for the relief of spasticity, and four abdominal sections for divers diseases.

Patients going to the dispensary are examined by the physicians allotted to that work. Those whose symptoms are not readily interpreted are taken to the chief of the department, who, after further examination, decides whether they shall be taken into the hospital for study and treat-

ment or whether they can be properly cared for in the therapeutic departments. Those whose symptoms are largely mental are put in the care of assistants who have both time and inclination to investigate such cases; and not infrequently one patient takes up the entire afternoon. This fact is mentioned to show that we are endeavoring to carry out the investigation of these cases in the manner that everyone who has much experience with them knows is the one way that augurs success. The careful and methodical physical examination that is made in these cases impresses them that every care is taken to investigate their disorders; it gives them a feeling of confidence and reliance which paves the way for the successful operation of those various measures and procedures which constitute psychotherapy. Such procedure is time consuming, and we realize that the only way to meet its demands is to have an adequate number of properly-trained assistants to care for them.

Patients who are taken into the hospital understand that this is done so that their diseases may be investigated by means of apparatuses, and by procedures, which are not available or applicable in the dispensary, and so that repeated frequent examinations and observations may be made. Such patients rarely remain longer than three or four weeks. At the end of that time we are usually in position to outline the course of treatment—dietetic, disciplinary, physical and moral—and to counsel and aid them in carrying it on outside the hospital. Provision has been made, however, for carrying out such plan of treatment in the hospital, whenever it is desirable, and many private patients are taken care of in the hospital during their entire period of illness. We hope soon to have in the country adjacent to New York a sanatorium branch of the hospital to which we can send those patients requiring prolonged treatment, and especially treatment by occupation, diversion, and education. Then the hospital in the city will be that for which it is designed, a place where nervous and mental diseases can be adequately studied and diagnosed, and where nurses can be trained to take care of such patients; and where physicians may have opportunity to familiarize themselves with such diseases. In pursuit of this plan, the Neurological Institute offers to physicians instruction in the diagnosis and treatment of nervous, mental, and metabolic diseases. It has unparalleled facilities for giving such instruction, not only in the diagnosis of these diseases, but in the treatment of them as well. Physicians are taken into the various therapeutic rooms and are taught how to give treatments by assisting the operators. The attending staff, who are teachers of many years' experience, realize that the only way to acquire the art of therapy is to participate in it. It cannot be taught by example or verbally. Students are given instruction in the hydriatic, Zander, Fraenkel, electrical and the various other departments devoted to therapy. They go also into the wards with the attending physicians and assist in the examinations of the patients. It is proposed to start a training-school for nurses in which an endeavor will

be made to teach women how to care for those who are ill of nervous diseases.

We venture to hope that the reproach so often made against the treatment of nervous diseases may be shown to be unmerited by the establishment and career of this institute, and by similar hospitals throughout this country. The sooner we realize that a very considerable part of all the suffering and misery of the world is due to "nerves," in one form or another, and the more earnestly we bend ourselves to the task of interpreting, combating and preventing them, the smaller will be the opportunity for the fanatic and crank to make this era ridiculous through denial of the existence of disease, and through teaching a system of pathogenesis that transcends human understanding.

PAGET'S DISEASE OF THE NIPPLE: REPORT OF AN INTERESTING CASE.

By ERNST JONAS, M. D., of St. Louis.

Clinically, the characteristic feature in Paget's disease of the nipple is an eczematous condition of the mamilla, involving the areola and surrounding skin, thus assuming the form of moist, vesicular eczema (*eczema madidans pustulosum*). The condition was first described by Sir James Paget in 1874 and was therefore justly called by his name.

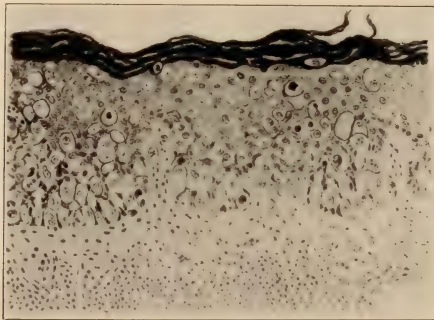


Fig. I. A typical picture of the transparent cells (the so-called Paget cells) which lie isolated in groups in the lower layers of the epidermis. They differ greatly from the epidermis cells; they are larger, their nuclei are bigger and richer in chromatin and have one or several nucleoli. Their protoplasm is clearer, they are not provided with prickles and spines and have no keratohyalin granules. No transitional cells between the so-called Paget cells and the prickle cells of the epidermis were found.

Paget reported fifteen cases all of which developed cancer of the breast *subsequently*. Paget believed that the changes in the skin were due to chronic irritation which caused a kind of eczema and suggested, as an explanation of the subsequent cancer of the breast in all his fifteen cases, "that a superficial disease induces in the structures beneath it, in the course of many months, such a degeneracy as makes them apt to become the seats of cancer; and that this is chiefly likely to be observed in the cases of those structures which appear to be, naturally, most liable to cancer, as the mammary gland, the tongue and the lower lip."

While his emphasis of this *subsequent* appearance of cancer in all of his cases and his recognition of a close relationship between the two conditions have been of the utmost value, his theory of the nature of that relationship no longer holds in the light of further investigations.

The fairly recent investigations of Jacobaeus leave hardly a doubt, to my mind, that Sir James Paget's theory, so long accepted and still more or less generally held to be correct, was erroneous. Jacobaeus has shown, by careful microscopical investigations, that the changes in the

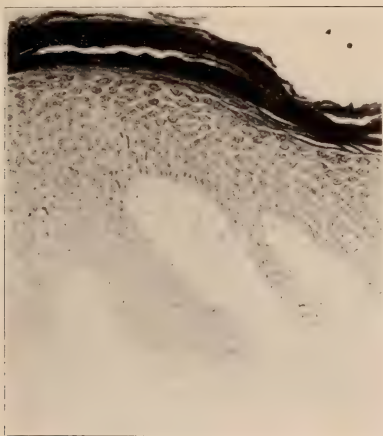


Fig. II. Taken from the margin of such an infiltration. The epidermal tissue sends cone-like projections into the deeper layers and separates the new cells; in this manner a mitosis is visible among these cells.

epidermis are not primary, but secondary, and that a carcinoma, starting from glandular cells within the nipple, is the origin of the disease, producing during its progress intra-epidermoidal changes which give the clinical semblance of chronic eczema. These findings of Jacobaeus have been verified by such careful investigators as Ribbert, Schambacher, Rodman and others.

The conclusions of Jacobaeus and pictures illustrative of his microscopic investigations follow:

1. Paget's disease is cancer from the very first, originating from the glandular epithelium of the lactiferous ducts.
2. The changes of the epidermis are due to the proliferation of the glandular cancer into the epidermis.

3. Paget cells are not epidermis cells, cancerously degenerated *in loco*, but migrated glandular cancer cells. Their appearance, isolated or in groups, depends upon the individual characteristics of the epidermis.

4. Proof of the foregoing lies in the fact that a microscopic picture, similar to that presented by Paget's disease, is produced, if a common glandular cancer ulcerates through the skin.

5. The relative benignity of these superficial tumors depends partly on the slight degree of virulence of the cancer itself, partly on the power of resistance to the proliferation of the tumor.

Fig. I. is a typical picture of the transparent cells (the so-called Paget cells) which lie isolated or in groups in the deeper layers of the epidermis. They differ greatly from the epidermis cells; they are larger,

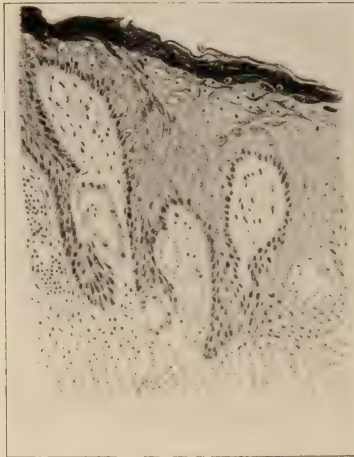


Fig. III. Represents an adenocarcinoma proliferating into the epidermis.

their nuclei are bigger and richer in chromatin and have one or several nucleoli. Their protoplasm is clearer, they are not provided with prickles and spines and have no keratohyalin granules. No transitional cells between the so-called Paget cells and the prickle cells of the epidermis were found.

Fig. II. is taken from the margin of such an infiltration. The epidermal tissue sends cone-like projections into the deeper layers and in this manner separates the new cells. A mitosis is visible among these cells.

Fig. III. represents an adenocarcinoma proliferating into the epidermis.

Fig. IV. shows solid trabeculae of the same tumor penetrating the epidermis. The cells lie isolated here and there and, in this way, a clinical picture as in Paget's disease is produced.

Fig. V. is a general view of the proliferation of the cancer-alveoli into the epidermis. In the periphery the cancer cells separate from the tumor either in groups or singly.

Fig. VI. is a melanotic tumor proliferating into the epidermis. The picture is the same as in Paget's disease, the only difference being the presence of melanotic pigment.

According to the collective evidence then, the so-called eczema in Paget's disease of the nipple is nothing else than an infiltration of cancer

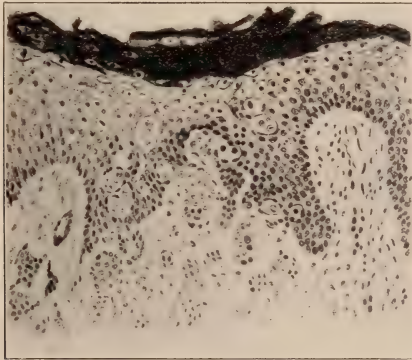


Fig. IV. Solid trabeculae of the same tumor penetrate the epidermis. The cells lie isolated here and there and in this way a clinical picture as in Paget's disease is produced.

cells into the skin. It is these cells, originating from glandular cells within the mamilla and proliferating into the epidermis, that give the epidermis a transparent appearance and thereby counterfeit the clinical picture of eczema.

Realization of the practical value of these investigations, at once forbids futile attempts to cure Paget's disease by local remedies. It is now evident that there is nothing to be gained thereby, while the opportunity for the proper treatment may be lost. This treatment should be most radical and involve the removal of the breast and axillary glands and also, in case of infection of the glands in Mohrenheim's space, the supra-clavicular lymph glands.

To avoid all possible misunderstanding, I may mention especially, that there are, of course, genuine cases of eczema of the nipple. These should yield promptly to the ordinary remedies. If they fail to do so, they should at once arouse suspicion as to the true nature of the disease. In the absence of any palpable tumor in the nipple or breast, a microscopical ex-

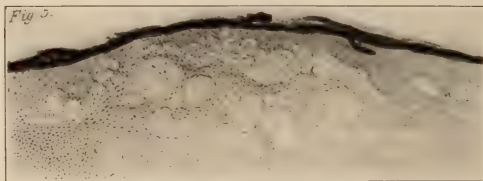


Fig. V. General view of the proliferation of the cancer-alveoli into the epidermis. In the periphery the cancer cells separate from the tumor either in groups or singly.

amination of an excised piece (removed under proper precautions) will clear up the case.

Just here I wish to call attention to the parallel which, to my mind, exists between Paget's disease of the nipple and leukoplakia of the tongue (psoriasis linguae). (Fig. VII.) Von Bergmann states that lingual or buccal leukoplakia predisposes to carcinoma. He found leukoplakia in fifty per cent. of his cases of cancer of the tongue and states that, in cases

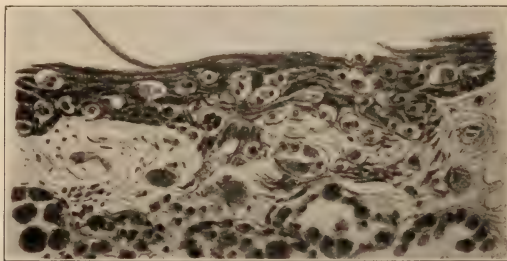


Fig. VI. A melanotic tumor proliferating into the epidermis. The picture is the same as in Paget's disease, the only difference being the presence of melanotic pigment.

of this kind, it is often very difficult to recognize the real limits of the carcinoma. If a leukoplakia spot penetrates the musculature of the tongue (microscopic examination), then according to Bergmann it should be considered as very suspicious of cancer and treated accordingly. It is more

than likely, I believe, that the condition is analogous to that in Paget's disease. The presence of leukoplakia in these cases of cancer of the tongue is probably an evidence of the cancerous condition of the glandular epithelium and is not to be considered as an affection which has secondarily degenerated into cancer. Here again I may mention that there are psoriasis-like conditions of the tongue or buccal mucous membrane of benign character, just as there are benign eczematous conditions of the nipple. A similar view is perhaps correct in regard to the carcinomata of the scrotum and penis among chimney-sweeps and other persons who



Fig. VII. (From Atlas of Clinical Surgery, Bockheimer-Marshall.)

handle coal and its products, such as tar, paraffin, etc. In some of these cases several warts, presumably the result of chronic irritation, are supposed to have undergone carcinomatous changes simultaneously. Is it not likely, that we have here still another analogy with Paget's disease of the nipple? We have need to be altogether more particular with regard to so-called "cancerous degeneration."

Before proceeding to the case report, I shall quote Paget's own description of the disease of the nipple, as given in Rodman's excellent monograph on "Diseases of the Breast": "It had the appearance of a

florid, intensely red, raw surface, very finely granular, as if nearly the whole surface of the epidermis were removed; like the surface of a very diffuse acute eczema, or like that of an acute balanitis. From such a surface on the whole or greater part of the nipple and areola, there was always copious, clear, yellowish, viscid exudation. The sensations were commonly tingling, itching and burning, but the malady was never attended by disturbances of the general health. In some of the cases the eruption has presented the characters of an ordinary chronic eczema, with minute vesications, succeeded by soft, moist, yellowish scabs or

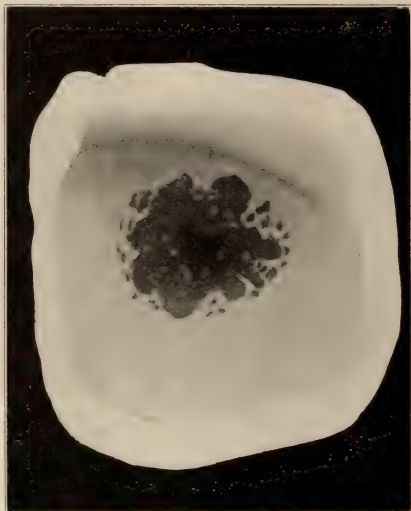
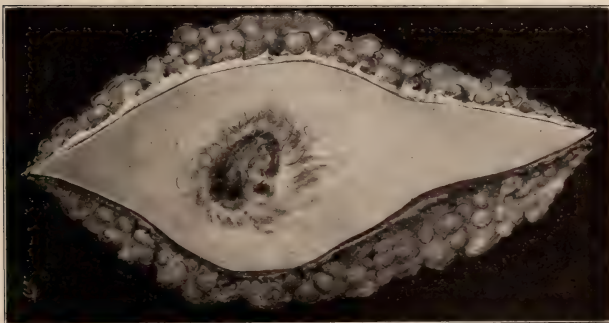
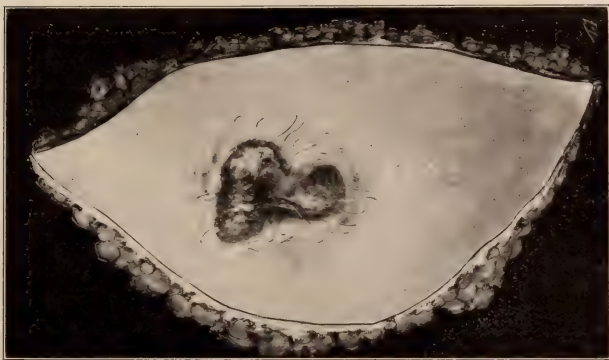


Fig. VIII.

rusts, and constant viscid exudation. In some it has been like psoriasis, dry, with a few white scales slowly desquamating, and in both these forms I have seen the eruption spreading far beyond the areola in widening circles, or, with scattered blotches of redness, covering nearly the whole breast" (Fig. VIII).

Case Report. Mr. J. W., referred to Dr. Tuholske and myself in March, 1909, by Dr. Friedman of St. Louis, aged 61 years, stated that two years before, he had noticed on the nipple of his right breast a few grayish scales and a slight redness. Some time after, the nipple became intensely red, had a granular appearance and looked as if the whole skin

had been removed. He took it to be an eczema and applied an ointment. A clear, yellowish, viscid fluid oozed from the nipple and from the areola which was soon similarly affected. The patient's attention had been called to the local trouble by itching and burning. About three months afterward, a similar process began on the other nipple. His general health did not suffer. Later crusts formed over the affected areas, which from



Figs. IX. and X.

time to time fell off and formed anew. The patient knew that there had been a remarkable predisposition in his family to malignant tumors of the breast. His father, a brother, his father's sister and her daughter had all died of cancer of the breast. Fearful of a dreaded diagnosis, he delayed seeking advice.

When he presented himself to us, two years after the beginning of the trouble, there was extensive ulceration in the region of both areolæ mammæ. Both nipples had entirely disappeared. The edges of both ulcerations were hard, raised and everted, their bases were hard and irregular. There was a purulent, badly smelling discharge from both sides. Scabs and crusts had formed on both ulcers, detachment of which gave rise to bleeding. The ulcerations were immovably connected with the chest wall. The accompanying illustrations clearly show the extent of both ulcerations.

The zone between both ulcers was normal. In both axillary cavities hard, indolent glands, as are typical of carcinoma, were palpable. The patient was informed of the gravity of his condition and advised to have both breasts removed, as an attempt to save him from certain death.

A radical operation (Rodman's incision) for both sides was performed, including the removal of the anterior aponeuroses of the recti muscles. This latter step, by the way, might well be more frequently added to the usual radical removal of cancer of the breast to prevent abdominal metastases. These latter seem to be more frequent than is generally supposed and are believed to occur through lymphatics penetrating the recti muscles. The patient did nicely, and left the hospital six weeks after the operation to take a trip to Europe.

When he returned six months later, he began to fail rapidly. There was no local recurrence of the growths, but it soon became evident that he had a metastasis in the spinal cord. An x-ray picture taken by Dr. R. D. Carman proved negative. The symptoms gradually grew more pronounced and a month later, the following symptoms indicated the location of the metastasis in the dorsal region of the spinal cord: (a) paralysis of the lower extremities, (b) paralysis of the bladder and rectum, resulting in retention of urine and feces, (c) anesthesia of both lower extremities and the lower part of the abdomen, (d) paralysis of the abdominal muscles, making respiration very shallow. Death resulted from an ascending pyelonephritis. An autopsy was refused. Upon microscopic examination, Dr. Tiedeman, pathologist of the Medical Department of Washington University, reported cancer of both breasts. The skin between the two ulcers revealed no change.

To Summarize. According to recent investigations, Paget's disease of the nipple is cancerous from the very first, rapidly involving the skin and the breast itself.

The practical result of this conclusion demands for Paget's disease the same prompt attention and radical surgical interference as is accorded all other cancers of the breast.

There is a striking parallelism between Paget's disease of the nipple and leukoplakia in cancer of the tongue; and also an analogy with certain cancers of the scrotum and penis, occurring in certain working classes.

OPERATION FOR CYSTOCELE: AN IMPROVED METHOD.

By D. TOD GILLIAM, M. D., of Columbus, Ohio.

Three years ago, at the meeting of the American Medical Association in Atlantic City, I described "A Simplified Cystocele Operation." Since that time, with a widening experience, I have improved the technique

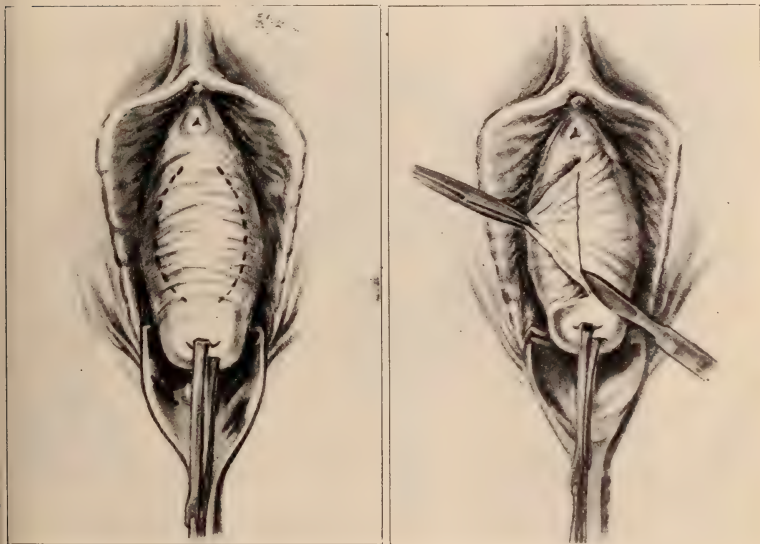


Fig. 1. The dotted lines give the scheme of the operation. The central area is to be denuded and on either side of which flaps are dissected from the vaginal wall to cover the denuded area.

Fig. 2. Incision at the base of the fold of redundant tissue which separates the area to be denuded from the flap which is to be dissected up and drawn over it.

of the operation until, as I conceive it, there is nothing to be desired either in simplicity or efficiency. Anyone who has had experience with the old time denudation operations knows how utterly unstable and useless they are, and anyone who has witnessed or done the radical opera-

tions of Watkins or Goffe, cannot but be made sensible of the formidable amount of dissection required in those operations. They are, however, thoroughly satisfactory when completed, and, as I believe, justifiable in the worst forms of cystocele, especially if associated with marked descensus of the uterus. Noble's operation, while apparently the most simple of all, is, according to my experience, more difficult to perform than the operation to be described, in that it requires a more extensive

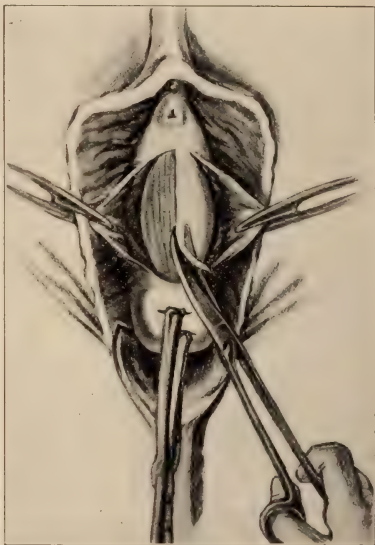
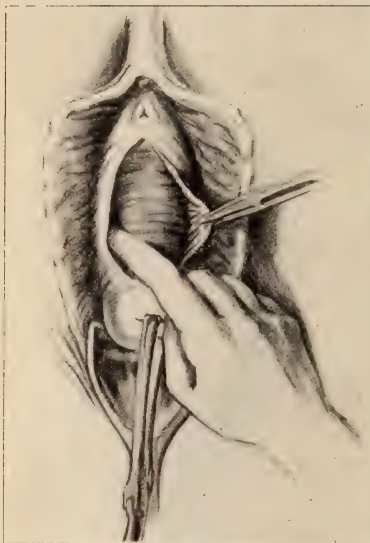


Fig. 3. Forming the flaps on either side of the area to be denuded by separating the vaginal mucosa from the bladder wall.

Fig. 4. Denuding the central area over which the lateral flaps are to be drawn and sutured.

dissection of the vaginal wall from the bladder at a point where such dissection is more difficult. Reverting to my own operation it consists of:

1. An oval denudation of the most prominent part of the cystocele as in the old time operation.
2. Dissecting flaps from the vaginal wall on either side of the denuded area with which to cover the latter.
3. Bringing the flaps together over the denuded area and suturing them to it and to each other.

The result is:—

(A) The cystocele is effaced.

(B) The site of the cystocele is strengthened by an additional layer of fascia,—that taken from the sides of the vaginal wall.

Technique. The patient being anesthetized, placed in the exaggerated lithotomy position and the perineum retracted, the first step is to gather up the redundant tissues along the median line of the anterior vaginal wall and mark out the lines of dissection. In my first work I seized the crest of the cystocele with a tissue-forceps and applied a light, long-

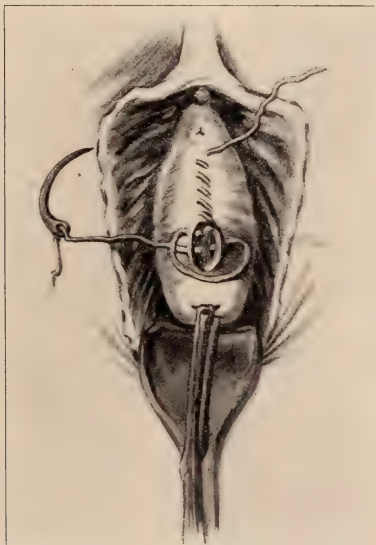


Fig. 5. Suturing the flaps to each other and to the denuded surface beneath them.

bladed forceps to the base of the fold which marked the line of incision on either side, but later I have dispensed with the base-forceps as unnecessary. The details are as follows:—

1. Lift up the redundant tissue (the cystocele) by means of a tissue-forceps.

2. Make an incision on one side of, and at the base of the fold, at, or near the median line. This incision should extend from within half an inch of one end of the fold to within half an inch of the other end.

3. Carry the incision down through the fascia to the muscularis of the bladder. A sharp knife and well-stretched tissues are essential to expeditious work here.

4. By blunt dissection, either with the handle of the knife, dissecting scissors, the gauze-covered finger, or as I usually prefer gauze held between the fingers, the bladder is separated from the vaginal wall in the direction of, and as far as the sulci and upward and downward the full length of the incision.

5. In making this dissection always keep the dissectors closely applied to the inner surface of the fascia and the latter well on the stretch by means of long-handled forceps. It is also well to remember if the finger or gauze is used that the bladder must be pushed off the fascia and not the contrary. Usually this dissection in this location is very easy and gives rise to little embarrassment, even to the inexperienced. To the latter I would say: Make your dissection carefully till you come to muscle-tissue, and the rest is smooth sailing. The other side is dealt with in like manner, when it will be observed that the central area—that which is to be denuded—is oval in shape and flanked on either side by the flaps dissected from the vaginal wall. This area is now denuded as in the old-fashioned operation.

6. The next step is to draw the flaps over the denuded area and to fasten them along the median line. To this end a suture is carried through the flap on one side at the lower extremity of the incision, through the middle part of the denuded area and across to the flap on the opposite side, and so on down the line until the denuded area is covered in by the flaps from either side. The suture may be of chromicized catgut or silkworm gut and may be interrupted or continuous. If interrupted a continuous catgut suture along the median line will be necessary to insure nice coaptation of the edges. When the cystocele is complicated with prolapse of the uterus a suspension operation may be necessary, in which case less extensive denudation should be made in the vagina. It goes without saying that the pelvic floor, if defective, should be repaired, as no plastic work on the anterior vaginal wall can long endure without its support. Recurring to my own experience, I have found the operation, so far as ease and facility of execution are concerned, all that I could wish. I have never known one to give way after having been done up in this manner. The dissection of the vaginal from the bladder wall is much easier when carried from the side than when begun in the median line. Altogether the operation along these lines seems as near the ideal as we are likely to attain.

MEDICAL AND SURGICAL PROGRESS.

BASEDOW'S DISEASE.

A REVIEW OF RECENT LITERATURE.

By JESSE S. MYER, M. D.

1. CARL A. V. BASEDOW.—Sudhoff (*Muench. Med. Wochenschr.*, April 5, 1910).
2. DIAGNOSIS AND THERAPY OF MORBUS BASEDOWII.—F. Chvostek (*Wien. klin. Wochenschr.*, February 10, 1910).
3. MORBUS BASEDOWII.—S. Federn (*Wiener klin. Wochenschr.*, April 21, 1910).
4. TREATMENT OF BASEDOW'S DISEASE.—A. Kocher (*Muench. Med. Wochenschr.*, March 29, 1910).
5. THE RESULTS OF "SPECIFIC" REMEDIES IN DISEASED STATES ACCOMPANIED BY HYPERTROPHY OF THE THYROID.—Rogers (*Annals of Surgery*, February, 1910).
6. LYMPHOCYTOSIS IN BASEDOW'S DISEASE.—Buhler (*Muench. Med. Wochenschr.*, May 10, 1910).

It is now seventy years since a physician in the little town of Merseburg published his treatise on "Exophthalmos Occasioned by Hypertrophy of the Orbital Tissues," describing clearly for the first time the clinical picture of the disease which now bears his name, Basedow's disease. The three cardinal symptoms, now often called the "Merseburger Triad"—goitre, exophthalmos and tachycardia—were clearly described and noted as being especially typical of the condition.

Chvostek thinks much confusion has arisen through the habit of putting all cases having one or two symptoms of Basedow's disease into the class of that disease. There is no danger of a mistaken diagnosis when the three typical symptoms of exophthalmos, goitre and tachycardia are accompanied by the other usual symptoms of tremor, indigestion, disturbed menstruation, etc. Unfortunately, however, the three cardinal symptoms do not always exist together and no single one of them is pathognomonic. The various symptoms, above all the minor ones, must be considered especially as to their synchronous development and course, and as to their etiological dependence upon changes in the thyroid. A large simple goitre by pressure on the veins of the neck and on the trachea may cause distinct disturbances in the nervous control of the circulation, or of the musculature of the heart as in the dyspneic "goitre-heart" of Kocher.

The author recalls no case of Morbus Basedowii in which tremor and thyroid change were not present. The most valuable single symptom,

however, is the bilateral exophthalmos, although it is not as constant as others, and appears slowly. The author believes it is only very exceptionally entirely absent during the entire course of the disease. Many of the symptoms which we associated more or less exclusively with Morbus Basedowii have no pathogenetic connection with the disease; for instance, the peculiar menstrual disturbances, attacks of rapid loss and gain in weight, the blood changes, pigmentation of the skin and perhaps Stellwagen's and Von Graefe's sign. The author has not had sufficient data to determine the diagnostic value of the relative lymphocytosis, but believes it may be valuable. He lays little stress on the Von Graefe sign and believes it absent in the majority of cases. The neurogenic theory of the disease deserves to be thrown out of court as entirely untenable.

Are there cases of masked Morbus Basedowii, the so-called *forme fruste* of the French? The author believes there are cases which run a mild course throughout, in which the most classical symptom—exophthalmos—is so slight as to be unrecognizable. In these cases the diagnosis is difficult or impossible. Various diagnostic manoeuvres have been suggested to determine these doubtful and borderline cases. The determinations of metabolic disturbance, the effect of atropine on the eye, deviation of the complement, etc., all the newer suggestions for diagnosis have not proven reliable.

In treatment, one word forms the basis—patience. He has seen good results from high altitudes—beginning with altitudes of 1800 feet in some cases. He has also had good results from galvanization and gives accurate directions for its application. Hydrotherapy is a useful adjuvant to these other measures. Drugs are of no value, heart stimulants are contraindicated. Surgery is only justifiable when these measures patiently carried out have failed, or when tracheal stenosis threatens, or on account of economic reasons, or on cosmetic grounds. The economic is the most frequent of these. "All things considered I have no reason to depart from conservative principles in the treatment of Morbus Basedowii, and will adhere to this until surgery or Roentgen therapy points a better way."

Federn maintains that the present theory which traces the cause of Basedow's disease to hypertrophy of the thyroid and over-functioning is no more an ultimate explanation of the cause of the disease than our knowledge that extirpation of the pancreas or disease of certain of its elements causes diabetes is an explanation of the etiology of diabetes. Federn believes that while the thyroid is responsible for most of the symptoms which we call Basedow's disease, this over-activity of the thyroid may be only secondary to a latent process which we do not recognize. It has been shown that the adrenals—in fact, all chromaffin tissue and the thyroid—have an antithetical action as regards their effect on blood-pressure. The author believes that Basedow's disease is brought about by an increased blood-pressure. This is usually caused by the absorption of poison from an atonic bowel (Federn has found an atonic condition of the colon in practically all cases of Basedow's disease), or by some other condition, as disease of the genitalia, worry, mental over-exertion, etc. The increased blood-pressure excites a compensatory stimulation of the thyroid, and, as in so many other instances, an over-compensatory stimulation. This over-stimulation of the thyroid gives rise to most of the symptoms which we call Basedow's disease. This theory, he maintains, points the way to a rational therapy. Laxatives to secure free movement of the bowel are to be given, and continued

for some time. Faradization of the colon, five minutes a day at first, with a current strong enough not to be unpleasant. Other additions may be made, but this must remain the foundation of therapeutic measures.

Kocher finds that the exophthalmos, even in its most extreme form may disappear after curative operation, with the other symptoms. The persistence of the exophthalmos seems to depend more on the time of operation than on its severity. Exophthalmos of long duration disappears slowly or not at all. Early operations offer better results than later ones; this is especially true in respect of the mortality immediately following operation. This does not mean, however, that late cases are to be refused operation, as Mayo does with cases showing edema, irregular heart action and albuminuria. These also may be rescued from the almost inevitable fatal end, if proper medical attention be given preparatory to operation, and the operation be then conducted step by step.

One-third of Kocher's cases were operated at more than one sitting. Five per cent. of Kocher's cases were not cured by operation, or not permanently cured; all were severe long standing cases. Among these are the cases in which Basedow's disease was cured but the resultant heart disease led to a fatal ending. Kocher urges that the operation be done early. He has never found any benefit from non-operative treatment except perhaps that of high altitude amplified by hydrotherapy and diet. Thyroidectin, antithyroidin, etc., are of no benefit. Galvanization produces no lasting good and has done harm in the author's hands. He has had some results from the serum prepared according to Roger and Beebe, but believes the method is theoretically unsound. It is possible that organotherapy may yet offer a substitute for operation.

In order to explain the phenomenon of exophthalmic goitre, Rogers has built up quite a complicated theory containing many wholly unproven hypotheses. Disturbances of the thyroid are said to go hand in hand with functional alterations of the pancreas and chromaffin system, these three organs acting in a compensating or mutual system. There may also be developed a vicious circle in this interaction which tends to aggravate or perpetuate pathological conditions involving any one. The author has made use of an antiserum, and also of pancreas extract or pancreatin in the treatment of the condition. He, moreover, believes that the administration of thyroid gland itself is indicated in most cases, at least at some stage. His results, however, have been so lacking in uniformity that he concludes, "the therapeutics of this peculiar disease are thus largely a matter of cautious experimentation in each case and seem to depend chiefly upon the vitality of the thyroid." The author advises such caution in the use of his methods that those wishing to carry them to trial should consult the original articles on the subject.

Buhler has found a relative lymphocytosis almost constant in Basedow's disease and believes that in doubtful cases the question as to whether hyperthyroidism exists may be decided by a differential leukocyte count. On the other hand he is not willing to say that hyperthyroidism is to be ruled out if a relative lymphocytosis is not present. The sign must not be looked upon as pathognomonic. Other conditions, especially cirrhosis of the liver and mumps, show in almost every case relative lymphocytosis. The statement that a leukopenia accompanies Basedow's disease could not be verified; the number of leukocytes was usually within normal limits.

THE WASSERMANN REACTION AND ITS RELATION TO THE
WORK OF THE OBSTETRICIAN AND GYNECOLOGIST.

A REVIEW OF RECENT LITERATURE.

By HUGO EHRENFEST, M. D.

1. SERODIAGNOSIS OF SYPHILIS IN PROSTITUTES.—Dreyer and Meirowsky (*Deut. med. Wochschr.*, 1909, p. 1698).
2. VIENNA LETTER.—(*Muench. med. Wochschr.*, 1909, p. 256).
3. SERODIAGNOSIS OF CONGENITAL SYPHILIS.—Thomson and Boas (*Hospitalstittende. Abst. in Jour. Amer. Med. Assoc.*, April 3, 1909, p. 1152).
4. THE WASSERMANN REACTION IN CONGENITAL SYPHILIS.—Thomson and Boas (*Berl. klin. Woch.*, No. 12, 1909).
5. SEROREACTION WITH HUMAN MILK.—Thomson (*Hospitalstittende. Abst. in Journ. Med. Assoc.*, January 8, 1910, p. 173).
6. THE SIGNIFICANCE OF WASSERMANN'S REACTION IN OBSTETRICS. Opitz (*Med. Klinik.*, 26 Juli, 1908).
7. SERODIAGNOSIS OF SYPHILIS IN PREGNANT WOMEN AND NEW-BORN INFANTS.—Bar et Daunet (*L'Obstétrique*, Paris, No. 4, 1909. Abst. in *Journ. Amer. Med. Assoc.*, July 17, 1909, p. 242).
8. THE PRACTICAL RESULTS OF THE WASSERMANN REACTION FOR THE GYNECOLOGIST.—Pust (*Gynack. Rundschau*, 1909, p. 433).
9. SERODIAGNOSIS OF SYPHILIS IN OBSTETRICS.—Engelmann (*Zentralbl. f. Gyn.*, 1909, p. 86).
10. PROBLEM OF LUETIC TRANSMISSION IN THE CHILD.—Bab (*Zentralbl. f. Gyn.*, 1909, p. 527).
11. EXPERIENCE WITH WASSERMANN'S REACTION.—Reinhart (*Muench. med. Woch.*, 1909, p. 2090).
12. ON THE HEREDITY OF SYPHILIS.—Frankel (*Monatschr. f. Geb. u. Gyn.*, February and March, 1910).
13. THE WASSERMANN REACTION.—Bergmann (*Med. Klinik.*, August 8, 1909).
14. HEREDITY OF SYPHILIS.—Baisch (*Muench. med. Woch.*, 1909, p. 1929).
15. BACTERIOLOGICAL AND HISTOLOGICAL INVESTIGATIONS IN CONGENITAL SYPHILIS.—Trinchese (*Muench. med. Woch.*, 1910, p. 574).
16. INFLUENCE OF SYPHILIS ON PROPAGATION.—Baisch (*Gyn. Rundschau*, 1909, p. 500).
17. VIENNA LETTER.—(*Journ. Amer. Med. Assoc.*, April 24, 1909).
18. THE SERUM AND PRECIPITATE REACTIONS FOR SYPHILIS AND THEIR CLINICAL VALUE.—Butler (*Jour. Amer. Med. Assoc.*, April 2, 1910, p. 1114).
19. POST-CONCEPTIONAL SYPHILIS AND WASSERMANN'S REACTION.—Wechselmann (*Deutsche med. Woch.*, No. 15, 1909).

20. WHAT EXPLANATIONS HAS THE SEROREACTION ADVANCED CONCERNING COLLES' AND PROFETA'S LAWS?—Bering (*Deutsche med. Woch.*, 1910, No. 5).
21. COLLES' LAW AND THE NEW INVESTIGATION OF SYPHILIS.—Knoepfelmacher (*Jahrb. der Kinderheilk.*, February, 1910).

A perusal of the immense literature on the Wassermann reaction seems to show that, with the possible exception of neurology, no other special branch of medicine has so extensively contributed to this literature and derived such important practical results from these investigations as have obstetrics and gynecology. The results of these researches may be divided into two groups: one comprising the thoroughly changed views concerning the prevalence, curability, and treatment of syphilis, while in the other group may be placed all the new knowledge gained concerning the transmissibility of syphilis to the offspring and the importance of a luetic infection in the etiology of various pathological conditions.

That the importance of the Wassermann reaction in the work of every physician is properly appreciated at the present day—at least in Europe—can be gained from the fact that, recently, by order of the Austrian Secretary of Education (2), the serological laboratory of the dermatological clinic of Professor Finger in Vienna has been thrown open to all hospitals and physicians. The examinations have to be made free of charge for all poor patients, while a charge of four dollars is made for those who can afford to pay. Similar institutions are now existing in Berlin, Breslau, and in other cities. The wisdom of such an order is obvious if we realize the frequency of syphilis from such investigations as, *e. g.*, have been made by Dreyer and Meirowsky (1) on 100 prostitutes. They show that practically all of them acquire a syphilitic infection within the first three years. Of these 100 prostitutes gave a distinct history of infection, while only 1 showed manifest lesions at the time of examination. Among the 43 remaining, who gave neither history nor clinical evidence of syphilis, no less than 32 gave a positive serum reaction, while 45 of the 56 women, known to be infected, reacted positive. Although only a comparatively small proportion of prostitutes show manifest syphilitic lesions at examinations, yet in reality from 83 to 89 per cent. are, or have been, infected.

Attention may be called in this connection to the well-known fact that a certain percentage of patients, infected beyond doubt, will give a negative reaction. It is generally known that this is the case, especially after a course of specific treatment. Also in new-born infants the reaction may at first be negative in spite of the presence of unmistakable symptoms of a congenital lues, the positive reaction becoming manifest only later. According to Thomson and Boas (4) in the latent syphilitic child during the first few months of life those substances which produce the positive reaction gradually increase. A similar uncertainty of the reaction has been observed by Thomson (5) while investigating the breast-milk of syphilitic mothers. In some instances the reaction was found positive soon after delivery, but later became negative. In comparing the milk of 17 syphilitic and 82 non-syphilitic mothers he obtained an apparently positive but much weaker reaction in the milk of some of the non-syphilitic patients.

This brings us at once to one of the most interesting and important subjects studied by means of the seroreaction—namely, the question of

transmission of syphilis from mother to child and the problem of immunization of the mother by a syphilitic child according to the law of Colles.

One of the earliest enthusiastic reports concerning the far-reaching importance of the Wassermann reaction in obstetrics came from Opitz (6). He applied the test in 104 mothers and obtained 10 positive reactions. Further observations showed that 8 of the children of these 10 mothers later developed the signs of an infection. He found a positive reaction only in 2 of these children, which in the light of more recent investigations, already referred to, are explainable by the fact that in the others the positive reaction may have developed later. Other investigations along these lines have been reported by Thomson and Boas (3).

Of 19 mothers who had given birth to children with unmistakable signs of syphilis, 16 gave a positive reaction, but 2 of the others had had a recent course of mercurial treatment. 9 out of 13 mothers with healthy children also reacted positive. The blood from the umbilical cord presented the typical reaction in 1 case in which the mother had been infected with syphilis twelve years before, and had taken two courses of 48 and 33 injections and had not observed the slightest manifestations of the disease during the last ten or eleven years and bore no traces of the infection. She had borne four healthy children since her infection and this latest infant seemed to be healthy at birth, but at the age of three weeks developed syphilides. The Wassermann reaction in this case was particularly pronounced in the woman's blood, suggesting possible reinfection, but nothing could be discovered to sustain this assumption. In every case in which anatomical changes were found in the umbilical cord the infants developed signs of syphilis sooner or later. A positive reaction in the mother reduces the probability of the child being sound.

The authors believe that it is possible for the substances inducing the reaction to pass from the mother through the placenta into the fetus, and thus permit a positive reaction while in reality the child is free from the disease. Every mother of a child giving a positive reaction should be regarded as syphilitic, although free from signs of the infection.

A communication by Bar and Daunet (7) from the Tarnier clinic at Paris gives the findings of the Wassermann test with 57 infants and their mothers. They seem to show that with florid syphilis in the mothers the serum reaction in the infants is less frequently positive than when the maternal syphilis is quiescent, merely probable, or suspected. The reaction is inclined to be negative in infants whose syphilitic mothers have been thoroughly treated. Negative findings in the infant of a woman with florid syphilis do not authorize the assumption that it is free from syphilis; positive signs have the same significance as in the mother. At the same time, the writers state, that partial or doubtful reactions are obtained frequently with infants whose mothers are free from syphilis beyond question. There seems to be some factor besides syphilis in the new-born which has a tendency to modify the reaction toward a positive result. This occurred in their tests generally in connection with bile pigments in the serum. A positive or partial reaction was obtained with the cerebro-spinal fluid of infants with syphilitic paralysis, untreated.

Bauer (*Wien. klin. Woch.*, 1908, No. 36), was the first to claim that mothers, apparently immunized, according to the law of Colles, actually are latent syphilitic patients. He had found a positive seroreaction in every mother of a congenital luetic child. Identical results have been

obtained by Ledermann and others. Opitz argued that the substances leading to a positive reaction in the mother may have been transmitted to her from the fetus, these same substances possibly also transmitting immunization. The answer to this argument lies in the proper interpretation of a positive Wassermann reaction. Such authorities as Neisser, Bruck, and Lesser state that the positive reaction must be considered conclusive of the fact that syphilitic virus is present in an active state. Nevertheless, it has been observed that men reacting positive have married without any apparent detriment, either to their wives or children. Thus it must be concluded that the Wassermann reaction may show also a latent state of infection which is not necessarily transmitted to the offspring, at least not from the father. All recent writers, however, seem to agree on the fact that the assumed immunized mother actually is latent syphilitic and menaces her offspring. Baisch (16) examined the mothers of 72 luetic children. In 63 the reaction was positive, in 9 negative. Out of these 63 mothers only 21 had distinct symptoms of the infection, while in the other 42 such were absent. They seemed perfectly well and had no knowledge of a syphilitic infection. For these 72 mothers, *i. e.*, 88 per cent. of mothers with syphilitic children the law of Colles was not applicable. As has been stated, 9 mothers of luetic children gave a negative reaction. All the fathers of these children who were examined, however, gave a positive reaction. Baisch emphasizes the fact that experience shows that the Wassermann reaction does fail in approximately 10 per cent. of cases exhibiting unmistakable symptoms of a florid syphilitic infection. Reinhart (11) also comes to the conclusion that apparently healthy mothers of syphilitic children are not immunized but in a state of latent syphilis. In the opinion of Bering (20) serodiagnosis has annulled the laws of Colles and Profeta. Mothers who have given birth to syphilitic children are not immunized but latent syphilitic. Children born of syphilitic mothers are not immunized, according to the law of profeta, but are either syphilitic or healthy. Similar are the views expressed by Knoepfelmacher (21).

Reference has been made to the fact that in the opinion of the most experienced investigators a positive reaction means an active state of syphilis. On the other hand, it has been argued that during pregnancy those antibodies, which make the reaction positive, may pass through the placenta either from fetus to mother or vice versa, and that these substances may possibly possess immunizing qualities, thus leading to positive reaction and immunization at the same time. This argument has been eliminated from this controversy by the very important work of Baisch (14). He combined in his investigations the Wassermann test, made both in mother and child, with microscopic search for the spirochete. He realized the weight of the argument, that a woman pregnant with a syphilitic child may give a positive reaction as the result of the presence in her blood of certain antibodies which either may have been transmitted directly from the fetal blood, or may have been formed by the mother in reaction to certain soluble toxins absorbed from the fetus. Baisch succeeded in proving that the substance inhibiting hemolysis does not pass through the placenta in either direction. He feels positive that this substance is formed only by an organism which is actually infected with spirochetes. Another seemingly convincing proof of the fallacy of Colles' law has been advanced by Engelmann (9) who reports the following interesting clinical observation: A woman married to a syphilitic man gave birth to several syphilitic children without

herself ever exhibiting any clinical symptoms of the infection. In a second marriage to a perfectly healthy man she gave birth to a child with manifestations of a hereditary syphilis. Wassermann reaction in the second husband was negative. This case then would prove the transmission of syphilis from an apparently healthy mother, presumably immunized, to the child of a second healthy husband; a proof positive for the fact that she was syphilitic. Bab (10), in discussing this case of Engelmann, calls attention to the fact that similar observations have been described and quoted from literature by Matzenauer who, long before the appearance of the work of Wassermann, had vigorously defended his idea that there is no direct paternal infection and that the so-called immunized mother in reality is latent syphilitic. The investigations of Frankel (12), quite recently published in an exhaustive paper which reviews the literature on the subject, force him to the conclusion that a mother who gives a positive reaction must be considered a carrier of spirochetes.

The semen of luetic individuals may contain spirochetes. This fact seems positively established by Finger's experiments on monkeys. Trinchese (15) explains that the transmission of the spirochete directly to the embryo could occur only in two ways: the spirochete may be embedded in the head of the fertilizing spermatozoon, or may enter the ovum at the time of beginning segmentation. He considers both of these ways impossible. The spirochete is larger than the head of the spermatozoon and, it must be assumed, would destroy the latter in its attempt to enter it. On the other hand, it could hardly be assumed that a large spirochete could lodge itself between the first forming blastomeres without either interfering with the further progress of normal segmentation or destroying the whole ovum. He believes that the spirochetes reach the endometrium with the semen, and that their pronounced longevity and motility enable them to enter deeply into the tissue. Thus they reach the maternal blood causing a true syphilitic infection of the mother. In spite of all these arguments and observations both Bab and Frankel still admit the theoretical possibility of an immunization of the mother without infection in certain, though rare instances.

Of far-reaching importance are the investigations made by many authors concerning the relation of maceration of the fetus to a syphilitic infection of the mother. Baisch (16) examined 100 infants, 95 of which were macerated while the 5 others bore the distinct signs of a luetic infection. Eighty per cent. of the macerated feti contained spirochetes; in 10 per cent. they could not be detected; in the other 10 per cent. maceration had progressed to such a degree that there was practically no chance to detect them. One-half of the mothers gave a positive Wassermann reaction. It can be concluded that from 85 to 90 per cent. of all macerated feti are luetic. In 30 instances both parents were examined. In 12 of them both showed a positive reaction. They had procreated 30 children of whom but 2 were alive. Of these, 2, one was born alive after a thorough mercury treatment of the father, the other after an antisyphilitic treatment of the mother during the course of pregnancy. For all these cases at least the law of Profeta is not applicable. I may be permitted to state in this connection that the law of Profeta usually is quoted incorrectly. He has claimed that this assumed acquired immunity is not permanent but only temporary, and in this form the law is not in absolute conflict with our present knowledge. We have referred to the fact that children born by syphilitic mothers, and who are undoubtedly syphilitic, at first may give a negative reaction.

In a discussion following the reading of Baisch's paper, Graefenberg confirmed the essayist's claim that the largest number of macerated feti are syphilitic, 92 per cent. in his own investigations. He also ascertained that pregnancy in no way interferes with the Wassermann reaction, and that examinations made during pregnancy are perfectly reliable. Seitz, Tissier, Girauld, and others have found definite proof of syphilis in 75 per cent. and more of all macerated feti.

Many of the authors already quoted, by means of the seroreaction, also established the importance of lues in the etiology of many instances of habitual abortion.

A most important practical result was obtained in the serological examination of wet-nurses. Opitz (6) as the first has pointed out the absolute necessity of subjecting every woman to the serum test before she can safely be engaged as wet-nurse. Bergmann (13) ascertained that of 75 wet-nurses, apparently perfectly healthy, 7 gave a positive reaction. In 4 children of these women distinct symptoms of syphilis were present. In 17 children manifesting signs of lues he found without exception the reaction positive. He also occasionally met with a positive reaction in children in the absence of any other symptom of syphilis. In other children the reaction, while at first negative, was later found positive. Bergmann suggests as an explanation for such observations the possibility of an infection acquired during the process of labor. As the immediate result of a paper read before the Medical Society of Vienna, by Sperk and Pollak (17), a movement has been started in the medical circles of that metropolis to take the business of providing wet-nurses out of the hands of professional agents, and turning it over to a municipal or state institution. There, every nurse and her baby would be subjected to a serological test before being permitted to suckle another child. A series of cases seen recently in one of the largest children's clinics in Vienna shows the imminence of the danger. In one case a wet-nurse infected a whole family. The suggestion has received unanimous assent, and a petition, signed by the leading physicians of the city and supported by the senate of the university, will be presented to the Board of Health, asking for the complete suppression, or reliable regulation, of such agencies.

The Wassermann reaction has led to a very radical change of views concerning the curability of lues, and in this aspect is of eminent importance in relation to the question when a syphilitic can be permitted to marry. In a very interesting article, in which Pust (8) considers all the various relations which the seroreaction bears to the work of the gynecologist, he expresses himself on this question as follows: "The permission to marry cannot depend solely upon one negative reaction. It must be considered in relation to clinical manifestations of the disease and the treatment the patient has received. Serological tests must be repeated; and negative tests, obtained for a long period of time, will justify the hope that the infection will not interfere with the process of generation."

Butler (18) thinks that patients should never be assured that they can be or have been cured of syphilis, for *once syphilitic, always syphilitic*. The continuous treatment of the first three or four years should be followed by the chronic intermittent treatment. No period of treatment should be interrupted unless the serum reaction has been found negative. No patient should go longer than three months in the earlier chronic intermittent treatment, nor longer than six months in later years without a serum test. In Butler's opinion the seroreaction alone

could not give any solution to the question of matrimony. This question must be solved in relation to the problem of contagiousness. After the period of time, which clinically has been regarded as necessary to elapse before a syphilitic can be considered safe to marry, his blood should be found negative to the serum test, and the same injunctions for further controlling his condition, as have been outlined above, would be advisable.

The elimination of Colles' and Profeta's laws forces us completely to recast the routine rules concerning the breast feeding of luetic children, and of the apparently healthy children of luetic mothers. This question has been instructively discussed by Wechselmann (19) and Pust (8).

It is important to apply the serum test both to mother and child in all suspicious cases. Especially in the new-born, skin lesions of an indistinct character will necessitate the test for a positive diagnosis. In the cases of syphilitic mothers the serum test of the child will at once, or possibly only after repeated examinations, show whether the apparently healthy infant actually is healthy or in a latent state of the infection. If the test is positive, both in mother and child, the child can be put to the breast of the mother. If the child shows manifestations of hereditary syphilis it can be nursed by the apparently healthy mother who must be considered infected. If the child's reaction is negative in the absence of luetic symptoms it should not be nursed by its syphilitic mother. The child of an infected mother should never be placed to the breast of another healthy woman, even if the child's reaction is negative. It is an established fact that symptomless latent syphilitic children, in whom the reaction at first may be negative, may infect wet-nurses. The congenitally infected child often develops the positive Wassermann only later in life. Those who still believe in the possibility of a direct paternal infection of the fetus warn against the nursing of a positive reacting child by a negatively reacting mother, and think it safer to resort to artificial feeding in all doubtful cases.

The last point to be considered is the effect of our new knowledge, gained by means of serological studies upon the therapy of syphilitic mothers and their children. It has become obvious that the mothers of luetic children, even if free from all syphilitic manifestations, must be subjected to a vigorous antisyphilitic treatment, since, presumably, they all are infected. The apparently healthy children of all syphilitic mothers must be examined repeatedly and should be treated whenever the sero-reaction is found positive.

At the writing of these lines the first enthusiastic reports reach this country of the marvelous results obtained with the new Ehrlich-Hata remedy, an arseno-phenol, briefly called No. 606. It is of interest in this connection that the first experiment upon a human being with this new remedy has been made by Wechselmann on a prematurely born syphilitic child in a hopeless, almost moribund, condition. The effect was most astonishing. All symptoms of the infection disappeared almost immediately, and the child recovered. The possibility of a recognition of even symptomless syphilis by means of Wassermann's reaction, together with the new Ehrlich-Hata remedy, undoubtedly justifies the hope that in the near future we shall be better able to deal with that complex disease—syphilis.

SOME NEW FREUDIAN LITERATURE.

A REVIEW OF RECENT LITERATURE.

By SIDNEY I. SCHWAB, M. D.

1. ON THE ETIOLOGY AND TREATMENT OF THE PSYCHONEUROSES.—Putnam (*Boston Medical and Surgical Journal*, July 21).
2. THE PSYCHOLOGY OF FREUD AND HIS SCHOOL.—Hart (*Journ. of Mental Science*, July, 1910).
3. FREUD'S THEORY OF DREAMS.—Ernest Jones (*Rev. Neurology and Psychiatry*, March, 1910).
4. FREUD'S PSYCHO-ANALYTIC METHOD.—Isserlin (*Leitschrift f. d. gesammte Neurologie u. Psychiatrie*, March, 1910).

When Professor James Putnam, of Harvard, at the last meeting of the American Neurological Association, rose to read his paper on his own experience with the Freud method of psycho-analysis, many of his hearers felt that a new era had begun in American neurology. The significant thing was that in place of the controversial papers hitherto provided when this subject was under consideration, here were recounted, by an undoubted authority in clinical neurology, experience with the method as he applied it to actual cases.

In a paper read at Toronto before the Canadian Medical Association, Putnam further elucidates his position in a definite and highly instructive form. This paper is full of significant statements. In criticizing the previous efforts in psychotherapy he clearly shows why, in the long run, failure has so frequently resulted. "The great bulk of all this therapeutic endeavor has been attempted to cure the patient by leading him to dwell on the possibilities of the future, and to forget the miseries of the past." The physician in such cases stands often with great devotion as a sort of professor's friend and shield, as it were, between the patient and his disease. Dubois, perhaps, of the living neurologists presents best the view Putnam points out with great clearness, that a disease so treated is not cured but veneered. He divides the physicians who have been leaders in this great field of studies into three groups: (1) The group of accurate observers, descriptive analysts and natural historians; (2) the group of therapists; (3) the group of constructive analysts, inductive reasoners and philosophical thinkers. Among those in the first group he mentions Fallert, Bricuet and Janet; in the second, Charcot, Mitchell, Liebault, Bernheim, Vaneeden, Forell, and Dubois; and in the third group Freud is mentioned as the most important and most significant figure.

The Freud method (to which the name of "psycho-analytic" has been given) does not depend for its therapeutic success upon the ability of the physician to hypnotize his patient, or of the patient to subject himself to the hypnotic influence. It is not an effort to spread the healing mantle of any "suggestive" influence over the painful details of the case. It is an attempt to enable the patient to penetrate with tireless zeal, increasing skill and fearless honesty, upon the details of his own emotions, life and thought, in the belief that nothing becomes less sacred or fails to

become less painful, through being clearly seen. Such being its purpose it is hard to see why many physicians should shrink from the difficulties attending its successful application. "Suggestion," "isolation," improvement of the bodily nutrition, persuasion, explanation, all of which have their valued place, leave many of the great springs of emotion and of motive entirely untouched. They make no adequate effort to base themselves on any deep knowledge of human nature. Their influence, however important it may be, is bound to be limited in its scope.

The psycho-analytic method does not indeed necessarily give us all that we may need for spiritual progress, but it prepares the way and opens a long path. It does not exclude the other modes of treatment but supplements some of them and often renders all of them unnecessary. If the slogan of suggestive psychotherapeutics has been: "You can do better if you try," the distinctive slogan of this method is "You can do better when you know."

A paper on the "Psychology of Freud and His School," by Bernhard Hart, is of great importance as it is the first serious attempt in English to consider the Freud system from a purely psychological point of view.

The present paper endeavors to describe, in a short and summary form, the principal tenets of the school of psychology founded by Professor Freud, of Vienna.

Genuine criticism of Freud's work hardly exists—we are badly in need of it. That which has been attempted has generally foundered upon one of two rocks. Many critics have totally failed to realize that Freud's views deal largely with conceptual constructions. They have imagined that his complexes and unconscious mental processes were phenomena on the plane of sensations and preceptions, and have asked how their existence can possibly be demonstrated. This is comparable to asking a Mendelian to produce his recessives and dominants for general inspection. It is surely obvious that Freud's conceptions can only be established or disproved by the process of applying them, and determining whether or not they suffice to explain the phenomena observed, and to predict the occurrence of future phenomena. Other critics—the majority—confuse the categories in the most lamentable manner. They attack Freud on the really astounding ground that his theories are ethically objectionable, that it would not be desirable for such things to be true, and that therefore they are not true. On the other hand, certain of Freud's followers are, perhaps, too enthusiastic, and tend to convert his school into something dangerously like a religious sect.

There can be no question that Freud's works contain some of the most valuable and stimulating contributions ever made to the progress of psychiatry. He has carried psychological determinism and the psychology of the individual to an extent never previously attempted. His demonstration of the fact that the flow of phenomenal consciousness is conditioned by psychological causes of whose existence the individual is altogether unaware—a fact known implicitly to every competent novelist and historian—opens up a fascinating vista for future research. We owe to Freud, again, the first clear formulation of the principle that mind can be treated as a phenomenon, capable of psychological explanation, and the first systematic attempt to construct a conceptual psychology—certainly a notable departure in the history of science. He has, moreover, established a firm basis for the oft-repeated phrase that the mental processes of the insane are only exaggerations of those found in the sane. Most important of all, he has shown the vast rôle which mental conflicts play in the psychology of both sane and insane.

On the other hand, some of Freud's work has been carried out by methods which do not altogether harmonize with the requirements of modern science. He has built up enormous structures upon bases which have not been adequately established, and formulated wide-reaching generalizations from a comparatively small number of facts. He may be said to have the genius rather of the poet than of the scientist. In all his books are ideas which astonish by the intensity of their illumination, and which inevitably arouse an answering thrill of conviction. But when he attempts to demonstrate their validity, the facts often seem insufficient, and the deductions unconvincing.

The need of the moment is—not the enthusiasm of the disciple who builds the structure ever higher, not the indiscriminating attack of the *a priori* opponent—but the cold criticism of the impartial investigator, who will examine the foundations with every care, and estimate the justification with which each stone has been laid upon another.

As a necessary complement to the use of the Freud analytic method, and as an essential element to the understanding of the whole subject, Freud's theory of dreams must be understood. Ernest Jones, who may be regarded, perhaps, as the foremost representative of the Freudian School in English, in a paper read before the American Psychological Association, gives a very clear account of the subject, giving particular attention to the published papers of Freud including "*Traumdeutung*."

These mental processes Freud terms the "dream thoughts"; they constitute the "latent content" of the dream in contrast to the "manifest content," which is the dream as related by the subject. It is important to keep distinct these two groups of mental processes, for on the appreciation of the difference between them rests the whole explanation of the puzzling riddles of dreams. The latent content, or dream thoughts, is a logical and integral part of the mental life of the individual, and contains none of the incongruous absurdities and other peculiar features that characterize the manifest content of most dreams. This manifest content is to be regarded as an allegorical expression of the underlying dream thoughts, or latent content. The distortion of the dream thoughts into the dream proper takes place by certain well-determined psychological laws, and for certain precise reasons. The core of Freud's theory, and the most original part of his contribution to the subject, resides in his tracing back this distortion to a "censor" which interposes an obstruction to the becoming-conscious of unconscious psychical processes. This conception he arrived at through the analysis of various abnormal psychical manifestations, the symptoms of hysteria, *Zwangsneurose*, etc., which he found to be constructed on a plan analogous to that of dreams.

A dream is thus not a confused and haphazard congeries of mental phenomena, but a distorted and disguised expression of highly significant psychical processes that have a very evident meaning, although in order to appreciate this meaning it is first necessary to translate the manifest content of the dream into its latent content in the same way that a hieroglyphic script yields its meaning only after it has been interpreted. The mechanisms, by means of which the manifest content has been formed from the underlying latent content, are mainly four. (1) The first of these is called condensation. Every element of the manifest content of the dream represents several dream thoughts; it is, as Freud puts it, "over-determined." Thus the material obtained by analysis of a dream is far richer and more extensive than the manifest content of the dream. (2) The second distorting mechanism is that termed displacement. In most

dreams it is found after analysis that there is no correspondence between the psychical intensity of a given element in the manifest content and the associated elements in the latent content. (3) The third mechanism is that termed dramatization. It is a familiar observation that the manifest content of most dreams is predominantly of a visual nature, so that it may be said that in this respect a dream resembles a theatrical presentation. (4) The fourth mechanism, that of secondary elaboration, fundamentally differs from the other three in that it arises from the activity, not of the underlying dream thoughts, but of the more conscious mental processes. To it we owe whatever degree of ordering, sequence, and consistency there may be found in a dream.

Freud couples with his investigations on dreams a penetrating inquiry into the nature of unconscious mental processes, the function of consciousness, and many allied subjects that I cannot here consider. I would conclude with a sentence of his, that "dream interpretation is the golden way to the knowledge of the unconscious in mental life."

The much more critical study of the Freud method comes from the pen of Max Isserlin. This study with a history of Freud's theory shows its development from the original publication in 1893 of Breuer and Freud's studies on hysteria. Isserlin shows how at first this work received little attention, and how first through the association experiments of the Zurich school an increasing importance was given to the new work. He mentions especially a careful critical review which Schultz presented in 1909. He calls again attention to the publication in 1909 of all of Freud's work with the exception of his dream, "Traumdeutung." He divides, for the sake of simplicity, the Freud work into three divisions: (1) The theory of infantile sexuality; (2) the so-called Freudian mechanism; (3) method of its analysis, that is, psycho-analysis. The psycho-analytical experiments of Freud depend, fundamentally, upon the principle of free association. The following criticism is advanced: Freud's theory is not in a position to prove that a *verdrangung* (displacement) in his sense and to the extent which he believes, exists in case where such displacements really are found. Freud has not been able to prove that his analytical method necessarily leads to the supplanted material. He has further given no means of controlling the fact that the mental material so displaced is of the nature that it is supposed to be. Although the relationship which should be, according to him, of etiological significance between symptoms and facts or pure hypothesis, what he believes to be of value in a psycho-analytic method, and useful in the study and treatment of cases is the first part of the experiment—that is, the analytic method which depends upon continuous association. In that we have a means which is often much better than an association experiment of penetrating into the soul of the patient. If we limit ourselves to the aid which an analysis gives; if we are careful to keep from too hurried conclusions in respect of the etiology; if we are further circumspect enough not to consider everything as true that points to the subconscious; and if we are kept from considering all these things, from the point of view of curability, there is much of value in the whole proceeding. The problem of substitution, the question of the emotional results of subconscious and conscious elements, the deepening of insight into the individual's normal and abnormal mental states, the problem of the content of a psychosis—all of these are questions with which investigation must still be concerned. It is not possible at the present moment, continues the author, to judge of the real work of Freud.

PULMONARY ROENTGENOLOGY.

A REVIEW OF RECENT LITERATURE.

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1. THE ROENTGEN RAY EXAMINATION IN THE DIAGNOSIS OF PULMONARY TUBERCULOSIS.—Krause (*Journ. Amer. Med. Assoc.*, February, 1909).
2. THE USE OF THE X-RAYS IN THE DIAGNOSIS OF PULMONARY TUBERCULOSIS.—Minor (*N. Y. Med. Journ.*, Vol. XCI., No. 12, March 19, 1910).
3. THE RADIOGRAPHIC DIAGNOSIS AND CLASSIFICATION OF EARLY PULMONARY TUBERCULOSIS.—Cole (*Amer. Journ. Med. Science*, No. 400, Vol. CXL., No. 1).
4. AS TO PARTIAL AND TOTAL ROENTGENOGRAMS OF THE LUNGS.—Rieder and Rosenthal (*Zeitschr. f. med. Electrologie u. Röntgenkunde*, Band X, 1908).
5. ROENTGEN ATLAS OF PULMONARY TUBERCULOSIS.—Ziegler and Krause (Stuber Verlag, Würzburg, 1910).

The ability of the Roentgen ray to record tissues of a density less than bone is proving of inestimable value in the correct diagnostic estimate of pulmonary pathology. The two methods of Roentgen ray usage—fluoroscopy and radiography—are both necessary to obtain diagnostic assistance, for each method has its peculiar advantages.

Fluoroscopy demands suitable apparatus that will permit the inspection of the entire chest. The ancient bellows fluoroscope is unsatisfactory. The demand is for a lead-glass covered fluoroscopic screen, with the tube in a freely movable, protected, light-proof box. These features combined with many others of accuracy and convenience, are found in apparatus modeled after a design universally attributed to Beclere. In such an apparatus, the tube is enclosed in a light and x-ray proof box, movable both laterally and vertically. The patient stands in front of the diaphragmed aperture of this box and the fluoroscopic screen is hung in front of the patient. It is essential that the fluoroscopic screen be used in an absolutely dark room, sufficient time in the dark having elapsed to insure the ocular accommodation of the examining physicians. It is claimed that ten minutes is necessary to accomplish the ocular accommodation to darkness after being in bright daylight.

The above apparatus requires the patient in a standing or sitting position for examination. To obtain similar results in the recumbent position, the trochoscope of the Holz knecht or Haenisch design is preferable. The trochoscope is a canvas covered table, under which the protected tube box moves freely upon tracks, the patient lies upon the canvas and the fluorescent screen is placed directly upon the patient's chest or back, as the case demands.

For the study of pulmonary pathology it becomes necessary to resort to radiographs in a few instances; the most important of which is the study of incipient tuberculosis, with the small foci or altered apical densities. The fluoroscope will point out the probable site of such pathology by a cloudiness or appreciable shadow; by the glands of the hilus casting increased shadows, or the shadows of the foci themselves. In the radiograph of the chest, with arrested respiration, we can then study the shadows with deliberation.

There is no doubt but that the future holds much in store for the extended use of this roentgen assistance in chest diagnosis. At the present time there are very few hospitals equipped to conduct such examinations properly. There is little expense attached to the fluoroscopic examination, the tube and screen expense being the greatest. One does not need the volume of current of a large coil to light up the tube sufficiently for the penetration necessary. The water cooled tube, while more expensive in first cost, is most economical. The anode of this tube does not heat up when cooled by a constant stream of water and the vacuum therefore remains more constant.

Discussion upon the relative merits of fluoroscopy and radiography continues. The fluoroscopic view of the chest in respiration permits one to note the excursion of the diaphragm; to determine the aeration of the lungs during normal and deep inspiration; to note whether a shadowy apex clears up on deep inspiration; to note the costo-diaphragmatic angle; the position of the heart; the change in the level of a hydro-thorax or pyo-thorax when the trunk is tilted; the differences in the size of the shadow cast by a cavity or echinococcus cyst in the anterior or posterior position, thus determining its location more exactly; the presence and effect of pleuritic adhesions, especially upon the diaphragm. These are a few of the points brought out by fluoroscopy and only surmised by radiographs. Fluoroscopy is much less expensive than a series of radiographs taken to record similar diagnostic facts. Radiographs, on the other hand, are necessary in the diagnosis of an early tuberculosis, as we then desire the best detail possible of suspicious tubercles, nodules or infiltration in the apices or around the roots of the lungs. The negatives should be taken during arrested respiration. In the study of the apices it is best to take a single negative with the diaphragm of the tube tilted at such an angle as to throw the clavicular shadows below the apices. The radiograph will give more chest detail than the cursory fluoroscopic examination, but will not give us the effect of respiration upon a cloudy apex nor other evidence previously detailed.

There is bound to be much disappointment if the physician attempts either radioscopy or radiographic chest diagnosis with inefficient apparatus. Fluoroscopy with the usual static machine is unsatisfactory, as there is not enough milliamperage to obtain penetration in the tube of selection. The installation of the inferior apparatus by the physician is injurious to his diagnostic efforts and to his knowledge of the value of the x-ray. The attending physician should seek the assistance of the trained roentgenologist as he does that of the microscopist.

During the past year have appeared several good text books on pulmonary roentgenology. These are all in the German language and it is lamentable that there is not sufficient demand to insure their translation. There is no doubt but that the perusal of such books in English would startle many who have remained indifferent to the ability of the roentgen ray to assist in the diagnosis of pulmonary pathology. The volume en-

titled, "Röntgenatlas der Lungentuberculose," by Ziegler and Krause, is especially recommended. This contains some sixty-one *x*-ray chest pictures upon heavy photographic paper, thus insuring the greatest reproductive detail. The clinical symptoms, findings and diagnosis, with the roentgenological description, accompanies each photograph. This volume should prove to the clinician that the *x*-ray is of inestimable value and the reproductions should inspire every roentgenologist to equal the technical results.

The basis of the roentgen method in pulmonary diagnosis depends upon its ability to record shadows of tissue densities and contour. The normal lung hilus, composed of the divisions of a bronchus, pulmonary arteries and veins, lymphatic glands and connective tissue, casts an irregular shadow with which one must become familiar before attempting to judge pathological shadows. Normally, also, there are shadows which resemble the figures upon marble, throughout the lungs. These are produced by the blood vessels and bronchial tree. The Germans call this normal lung shadow "Marmorierung"—marbling. Therefore, in the estimation of pathological shadows in the diagnosis of pulmonary tuberculosis we must take these normal markings into account. The incipient tubercular case may present an increased hilus shadow from the enlarged bronchial lymphatic glands. Distinct single glandular enlargements are frequently found. There will be, apparently, shadows of whip-cord size radiating from the hilus to the affected lung area. These become quite marked in late cases or their distinctness blurred by the infiltration of surrounding lung tissue. The area of tubercular infiltration will be cloudy and this cloudiness may or may not clear up somewhat upon deep inspiration. The diminished movement of the diaphragm upon the affected side (Williams' sign) may or may not be present in about fifty per cent. of cases.

The conservative conclusions of Krause in the estimation of the roentgen findings of incipient tuberculosis are as follows:

1. Infiltrations at the apex, recognizable by percussion, which have a known extent, give a more or less deep shadow with the fluoroscope. The *x*-ray examination is frequently superior to the clinical, since it demonstrates that in many cases the process is more extensive than would be expected.

2. Infiltration either not demonstrable by percussion or only uncertainly so, can frequently be demonstrated by fluoroscope and certainly by the *x*-ray negative, using the diaphragm for apices. Besides, by this method it will be frequently shown that we are dealing with a more advanced case than was suspected.

3. In early stages purely catarrhal processes are recognizable neither by fluoroscope or radiograph. In long standing catarrh, the results of poor aeration are seen by fluoroscope as darker apices which do not clear up on inspiration. In important cases, radiographs in the shape of diaphragmed apical negatives should be employed. Beginning infiltrations are frequently recognized by this method.

4. The height and width of the apices are points for further study. Freund states that calcification of the first rib cartilage can be used as a diagnostic aid in incipient tuberculosis. The clearing of the apices which is present in health is frequently lacking in one or both sides in early tuberculosis.

The size and position of the heart does not furnish arbitrary roentgenologic findings. Some claim that the heart is vertically placed in

tuberculosis pulmonalis, but others have indicated that an enlarged heart is usually found.

It is not generally claimed that the *x*-ray will detect lung changes before physical signs are present; but it is a fact that physical signs are frequently overlooked by the hurried clinician. Where the physical signs are probably only suspicious, not well marked, even observed by skilled diagnosticians, the *x*-ray examination of such a case will frequently surprise the observers, as the process may be more extensive than calculated. Incipient cases of tuberculosis are overlooked by physicians who do not take time and diligence in examination. But where one finds suspicious shadows upon a roentgen negative, it will likewise be determined by auscultation, percussion and laboratory findings that there is good cause for these shadows. In no field of roentgenology does the interpretation of shadows call for more careful study, estimation of densities and technical experience.

Cole's splendid article would indicate utopian possibilities in roentgenology. He reports several cases where "keen" diagnosticians had overlooked lung pathology. From an inspection of the negatives of these cases it would hardly seem possible that such tissue changes in the lungs had escaped careful and repeated physical examinations. If one were to choose between a hasty physical examination and an *x*-ray examination, there is no doubt but that the incipient case would be appreciated earlier by the *x*-ray examination.

Many observers have shown that tuberculosis of the lungs finds its origin in the lymphatic glands at the root of a lung, with subsequent parenchymal involvement. Cole states that he has never seen a tubercular lesion of the parenchyma without typical tuberculous infiltration around the root of the lung. Especially in children do we find this infiltration of the bronchial glands without parenchymal involvement.

The second and third stages of pulmonary tuberculosis produce typical shadows upon the fluoroscopic screen or *x*-ray plate. Distinct areas of infiltration and consolidation, with the roots of the lungs casting correspondingly enlarged shadows, are seen. Cavity formations, either filled with exudate or empty, are easily indicated. If partly filled with exudate, the level of the exudate and its change of niveau by tilting the trunk is appreciable. It will generally be found that the size of a cavity will be larger than is outlined by percussion and small cavities well within the lung substance, not appreciated by physical examination, will be indicated upon the *x*-ray negative. The compensatory emphysema of the best lung is appreciated by the horizontal rib outlines and the descent of the diaphragm upon the unaffected side.

There is no doubt but that the roentgen examination of a suspicious incipient case can lend valuable assistance to the physical and laboratory examinations. The *x*-ray negative or screen examination will call the clinician's attention to suspicious areas, and if there are pathological shadows there will surely be auscultory alterations to substantiate. This clinical examination should, however, be conducted and repeated if necessary, under favorable circumstances. The careless or technically imperfect roentgenologist will misjudge as large a percentage of cases as the careless or hurried clinician.

OBITER DICTA FROM FOREIGN JOURNALS.

CHOLERA IN EUROPE (1904-1910).

"In September, 1904," said Chantemesse in a paper read at a meeting of the Académie de Médecine on July 19th, "the real epidemic of cholera appeared in Russia by way of Baku, which seaport was infected by Persia." In a preceding communication Chantemesse showed how this epidemic, brought into Hedjaz by the Indian pilgrims in March, 1902, had gradually made its way as far as Russia. Here are the stages: From Hedjaz the epidemic spread to Egypt (July, 1902), to the Mediterranean shore up to Damascus (January, 1903), then to Bagdad (1904), and finally to Persia up to the shores of the Caspian Sea, from where it extended step by step to Baku and the mouth of the Volga.

In the autumn of 1904, cholera quartered itself in the southern regions of the Russian Empire; it invaded the Caucasus and the course of the Volga, from its mouth up to Saratoff. 3000 people were stricken and of this number 2000 died. The winter stopped its progress, but this was but temporary, for in the following year (August, 1905), it sprang up unexpectedly in Poland; then spread slowly through the territory of the Vistula, gathering only 400 victims; but its feeble manifestations did not prevent its sporadic appearances in Berlin, Oranienburg and in Austrian Galicia.

In 1906 the epidemic was quiescent, but all of a sudden (July, 1907), cases were reported in Astrakhan; before long the basins of the great rivers, the Volga, the Don, and the Dnieper, were no longer immune, and finally St. Petersburg was host to the disease. More than 6000 persons succumbed to the epidemic during the autumn of 1907. The winter brought back the usual quietus, except on the Russo-Turkish frontier of the Caucasus. Because of the departure of the Mohammedan pilgrims from this region at this time, the hadjis were instrumental in introducing cholera in the lazaretto at Sinope, where it apparently seemed to stop. Despite the isolation measures which were taken against the pilgrims, the disease manifested itself in these wandering hadjis at Constantinople. Fortunately, the winter interceded.

At the same time, in the vilayet of Hedjaz, Turkey, cholera reappeared, brought to this province, according to report, by the Mohammedan pilgrims arriving from Russia, or perhaps by those coming from India, since the disease had been recognized in the lazaretto at Karahan. Mecca alone furnished more than 4000 deaths.

In Russia, in the meantime, cholera spread beyond the boundaries of Astrakhan and the year 1908 had to its credit nearly 30,000 victims and more than 14,000 deaths. The winter, as usual antagonized the disease in the northern regions, but had no effect on it in the southern provinces, and with the advent of the heated term of 1909, its activity was renewed. The entire empire was infected from St. Petersburg to Baku, from Archangel to the Crimea. The middle provinces and those in the north furnished the largest number of victims. In all,

there were 21,000 cases and more than 9000 deaths. But Russia soon compelled other countries to pay tribute.' In the month of August a case of cholera was reported at Stockholm, the victim being a traveler from Russia; a few days later, a number of sailors at Rotterdam, as well as the inhabitants of that town, were attacked. The disease spread to Holland and soon 18 towns had cases, but its manner of spreading was both unexpected and surprising. In each place only a small number were the victims. In eastern Prussia, Koenigsberg and nine other German towns received a visitation. It spread to Belgium and in the hamlet of Boom, twenty kilometres from Antwerp, 9 had the disease.

The question which arises is, Why are there so many victims in certain regions and so few in others? Is there a mode of propagation of cholera which is not understood to-day? These problems should engage our attention.

The spread of cholera into Germany and Holland was effected in two entirely different ways. That part of Russia bordering on the Baltic being contaminated, the disease gained ground slowly and surreptitiously and thus invaded the Russo-German frontier in an underhand way. This method of entrance into a hitherto unaffected country is the *propagation* of cholera from place to place, unattended by any case to mark its trail, or any trace by which the links in its progress can be detected. The persistency and dangers inherent in this mode of travel were recognized by physicians many generations back, who explained these peculiarities by attributing to this pestilence the invincible epidemic spirit.

The other method is that of *transport*, for it results from ocean or railway travel. Here, at least, we can cope with something that is tangible. As illustrative of this method of spreading the pestilence, Holland is a case in point. The Elberfeld, which was held responsible for introducing cholera into Rotterdam, is one of the merchant vessels which during the summer crosses the Baltic and the North Sea and delivers at various points its cargo of lumber. In July, 1909, this boat lay in the harbor of St. Petersburg for eight days and when it left on July 16th the greater part of its passengers belonged to that town. On the 23rd it arrived in Holland with a case of cholera on board. The boat was placed in quarantine at Hook of Holland and the patient died. It was disinfected and the drinking water thrown away, after which it was allowed to continue its journey to Rotterdam where its cargo was unloaded. Some days passed without any incident, when all of a sudden four children in Rotterdam were attacked with cholera. The father and the eldest brother of the children had assisted in unloading the Elberfeld but showed no evidence of having contracted the disease. The inference was that the deceased sailor was not the only one on board who was infected. His comrades having lived in a similar manner at St. Petersburg, were probably equally contaminated; but instead of presenting the symptoms of the disease in a manifest manner, they were simply the carriers of the bacilli. Nevertheless, they were excellent agents to infect the workmen with whom they came in contact during the unloading of the Elberfeld. The following indisputable fact cannot but throw considerable light on the possibilities of contagion: The mother of the choleraic children, though not in any apparent way menaced by the disease, was without doubt the carrier of the bacilli.

Rotterdam and its surroundings are cut into islands by a network of canals. Sailors who contract cholera before it is epidemic are excellent media through which the pestilence may be spread during voyages along

the numerous waterways. Now, how is the contagion effected? The hypothesis entertained by the majority of investigators was that the Meuse being infected, the sailors and those who lived along the rivers and canals were contaminated by drinking its water. But could this be possible when one takes into consideration the effect the tide has on rivers? Then there were others who thought that the water, which had been placed in barrels on the barges at the already infected town of Rotterdam, was the vehicle in effecting the epidemic.

While Chantemesse does not deny the importance of the factor of water in the etiology of cholera, he thinks that alongside this theory other hypotheses should be placed and elucidated, if we hope to evolve a sanitary defence as stringent as possible. The following is his explanation of the contagion as he conceives it to have occurred at Rotterdam. The merchant vessels which carry wood from the pine forests of Russia, pile up their cargo not only in the hold of the ship, but also on the deck almost up to the foot bridge. Directly the vessel arrives in port, barges are placed alongside and the unloading begins. The vessel gradually rises above the water and before long the openings of its water-closets, which, when the vessel is loaded, are below the water line, are now on a level with the barges. If a sailor uses the closet at this time, the fecal matter no longer falls into the water, but is splashed on the barge itself. Those who have watched the unloading of a cargo-boat, no doubt recall the tragi-comic scenes which are enacted between the sailors and the bargemen when this takes place. Now, if the person from whom the fecal matter issues is in the incubative stage of the disease, or even if he is simply a carrier of the bacilli, the barges are contaminated. The flies, by alighting on the fecal matter and carrying particles to the kitchen of a barge where food is being prepared whilst the unloading is in progress, can be the means of infecting the milk, bread and meat. These facts, which Chantemesse emphasizes, indicate that the greatest surveillance should be exercised in regard to vessels during their sojourn in port.

When cholera invaded Holland, why were the cases few in number? The answer is not difficult to find, since it is a fact of which the Dutch may well be proud that they not only war against the invasion of the disease, but also take decisive measures to isolate those who have been exposed to it by contact with suspected cases. As proof of Dutch thoroughness in the matter, all persons who have any knowledge of a case of cholera must report it under penalty of prosecution which is punishable by fine or imprisonment. Immediately after the declaration, the suspect was isolated, as well as every one in his home. This isolation was continued until the bacteriological examination was made and ceased only after the examination was proved negative. If it was positive, all persons were removed from the house, which was at once disinfected, the police remaining around to prevent robbery. The persons who had been in contact with the patient were placed in one of the hospital pavilions, where they were daily examined during the usual period of incubation. A bacteriological examination of the stools of all persons who were isolated was made and in case it was proved that they were carriers of the bacilli, their isolation continued until all trace of infection had disappeared from the intestines. In this way almost 114 persons were isolated on account of a single case. The persons placed under observation were fed at the expense of the State and received their salaries as if still working. Such was the method of defence.

This is certainly expensive and difficult to apply, but when persisted in there can be no denial that the results are prodigious. The sums expended by Holland, though large, were smaller than the amount of money a country spends to combat the spread of the epidemic once it gets a footing. What were the results of this Dutch stringency? Brought into Rotterdam, the epidemic had to its credit 31 cases and 14 deaths, out of a population of 250,000 inhabitants. And yet these figures are considerable when comparisons are made with what occurred in other Dutch towns, though in making these comparisons the thought should not be lost that Rotterdam being the first city to be visited by the disease, the efforts to stay its progress were somewhat paralyzed by the suddenness of its advent. At Amsterdam, for instance, only one case was observed in a population of 350,000 inhabitants. In the other infected localities—some 16—not more than one case occurred at a time, and the number never amounted to more than 4 in any one place.

The fight against cholera, as evidenced in Holland, is admirable since everything that may be untoward is foreseen. All details are carried out with precision; each and every person who has the matter of investigation in hand is imbued with the idea that he is working in the service of science and that such petty matters as expense, and inconvenience to those who are but indirectly connected with the spread of the disease, must be overlooked. Not a moment is lost, not an effort is hindered under the pretext of awaiting orders to authorize the expenditure of certain sums that are deemed necessary. By the lessons which Germany, Holland and Belgium have taught us, a defensive method against cholera has been instituted, whose efficacy is brought to light at this moment on account of the re-awakening of the epidemic in Russia.

CORRESPONDENCE.

PARIS LETTER.

THE EBERTHIAN TOXIC INFECTION.

By AUGUSTE A. HOUSQUAINS, M. D.

It can be said in all truth that the history of typhoid fever, in respect of its being an autonomous and specific malady, dates from the beginning of the nineteenth century. It was in fact at that epoch that the advancement in pathological anatomy made possible the grouping of a certain number of clinical modalities described by the older investigators. In 1820 Bretonneau gave an exact description of the intestinal lesion, establishing the relation between that lesion and the disease, and advanced the question of specificity which the later discovery of Eberth was to confirm. From this time on, with the assistance of bacteriology, it was possible to ferret out more easily and study more completely the divers clinical manifestations.

The progress made in the matter of blood-culture enlarged still more our conception of the disease by correcting the error until then widespread, even with the classical authors, and which consisted in denying the habitual presence of the Eberth bacillus in the blood of patients with typhoid fever. Furthermore, Wyssolnowitz's law proclaimed that in typhoid fever the Eberth bacillus is absent from the general circulation and is found only under exceptional circumstances. But, truth to say, all the researches undertaken to discover the Eberth bacillus in the blood have not been altogether negative. Moreover, the bacillus has been found in the lenticular rose-pink spots and in the urine, indications evidencing that the morbid germ could be supplied only by the blood. Thus negative facts have increased our credence, and it is on these that a general formula has been erected.

A defect in the technique is responsible only too often for the lack of success in finding Eberth's bacillus, on account of the examination being made with an insufficient amount of blood, as well as an insufficient quantity of bouillon. If the bacteremia is not intense, one can easily understand that a drop or even a cubic centimetre of blood will not suffice upon which to base a conclusion. Again, if the quantity of blood is greater and the amount of bouillon is below what it should be, the Eberth bacilli contained in the cultures are neutralized by the antitoxins normally contained in the serum of a typhoid fever patient. Only when the research can be made with a sufficient quantity of blood and bouillon is the presence of the bacillus of Eberth in the blood frequently established, and as a fact of indisputable worth. Schottmueller has described a technique by which he finds the bacillus of Eberth in the blood forty out

of fifty times; but it is Castellani's method which has been adopted in France, Germany and America. While Schottmueller utilizes from 15 to 20 c.c. of the hematic fluid, which he divides in a series of Petri dishes, Castellani, on the contrary, uses bouillon-cultures of 300 c.c. In Germany, Kayzer cultivates the Eberth bacillus with a mixture of bile and bouillon, by which he achieves the best results.

From statistics published by V. Audibert, of Marseilles, 348 examinations yielded 302 positive cases, that is about 86 per cent.; hence the conclusion to be drawn, though in opposition to Wyssolnowitz's law, would coincide with Lémierre in that typhoid fever must be considered as the most septicemic of the infectious diseases. Be that as it may, it is well established that if one knows how to look for the bacillus of Eberth, one will very frequently find it in the blood of a typhoid fever case at an early stage, even before the clinical features are apparent. Conradi has shown that the bacillus exists in the blood during the period of incubation, and other authors have found it in the early stages in cases which are under observation in hospitals. This fact is of importance, since at this period there are no bacilli in the feces, and, in case of death before any further development, Peyer's patches are found intact.

During the first week of dothienenteritis, the presence of the bacillus in the blood may be established; during the second its frequency is the same; but during the third week, while its infrequency may be noted, it does not disappear altogether. During a relapse the bacillus is still present. As regards the quantity of the bacilli found, one is justified in saying that the greater the gravity of the disease, the more abundant is the bacillemia and the more frequently the quantity is revealed. In the benign form of the disease, the bacillus is just as often present, and just because it cannot be found does not necessarily indicate that the pathogenic germ is absent.

The bacillus of Eberth may, moreover, be associated in the blood of the typhoidal patient with the other pathogenic germs. These germs are the streptococcus, the staphylococcus, the bacillus coli and the pneumococcus. The latest researches undoubtedly show the influence of these microbial associations on the clinical history, evolution, and prognosis of typhoid fever. The differentiation of the divers microbes associated with the bacillus of Eberth should be made with extreme care, as it is important to recognize the bacilli which are similar and which cause analogous clinical types—namely, the paratyphoid bacilli. Here is a field but as yet little explored. But, on the other hand, the endeavors undertaken to reproduce the Eberthian septicemia experimentally are much more advanced. Though some authors have denied the possibility of creating experimentally a septicemia and not a simple toxemia by inoculation with the bacillus of Eberth, the matter is now established beyond a doubt. In this way a disease is produced which anatomically and clinically is typical of typhoid fever; hence it must be admitted that the experimental Eberthemia is possible and can be followed by intestinal lesions, at first congestive, but later on ulcerative. After a septicemic invasion the bacillus fastens itself only secondarily in the niveau of the intestine. The difference between the grave septicemic form and the intestinal form is only a matter of degree; in the first instance, the subject succumbs so rapidly that the time is too short for the occurrence of lesions in the intestinal lymphoidal tissue. It is necessary also to remember that the diverse states of resistance on the part of the organism can react differently to the infection, according to the circumstances. Thus Eberthemia cannot be followed by intestinal lesions and remain in a state of septi-

cemia of variable intensity. It is precisely on account of this that we ought to make much of certain considerations bearing on the disease.

It is established beyond question that the bacillus is constantly present in the blood of those who have been attacked with Eberthian affections. Long before the bacillus is in the fecal matter it is in the blood of those afflicted with typhoid; in short, it may be found during the period of incubation. Eberthemia produced by subcutaneous incubation of cultures may determine the starting of a typical typhoid fever with its characteristic clinical syndrome and its intestinal lesions. What is evident is that in this sort of case the infection and ulceration of Peyer's patches are effected by the microbial invasion from without inwards and not from within outwards; hence it would be irrational to regard typhoid fever as a primitive enteritis following a general infection. It would be more in the line of truth to look upon it as a septicemia secondarily localized in the niveau of the lymphoidal mass of the intestine. Thus typhoid fever ought no longer to be considered as the exclusive manifestations of the infection by the bacillus of Eberth. Undoubtedly that side of the disease which is perfectly characteristic, both clinically and anatomically, remains intangible; but what should be recognized is that the Eberthian toxic infection constitutes in reality an entity which is much more general than usually thought, and that dothienenteritis is only one of the modalities of this toxic infection. An Eberthian infection may continue in a state of pure septicemia with general symptoms but without localization in the intestine. It must not be thought that this interpretation of experimental facts is limited only to the artificial Eberthemia, which causes a septicemia without specific lesions; on the contrary, facts which are identically the same are observed when a clinical study is made. Cases of typhoid fever without intestinal lesions are known and described; these are the cases of dothienenteritis with toxic infection but without intestinal ulcerations.

It goes without saying that this septicemia is not necessarily fatal, for some of the cases may be slight while others may be grave. Two essential factors should be remembered in all infections: the virulence of the infection and the resistance of the organism. Those cases which are slight may not be recognized at all or be wrongly diagnosed, but their existence cannot be denied, since a clinical and bacteriological examination demonstrates the fact.

M. V. Audibert sums up the matters discussed in this letter as follows: Eberthemia, similar to streptococcemia or pneumococcemia, should be looked upon as a general morbid entity and dothienenteritis should not be regarded as the complete history of this infection. In other words, there may be an Eberthian infection without dothienenteritis; the latter being only a localization of a morbid process to be classed in the same category with thyroiditis, cholecystitis, pleurisy, or Eberthian meningitis. Our increasing knowledge of blood-culture and the greater care with which clinical studies are pursued, will undoubtedly be of great assistance in the diagnoses of a certain number of infectious morbid states, the causes of which to-day are yet undetermined matters.

August 10th.

DIAGNOSTIC AND THERAPEUTIC NOTES.

A NEW TEST FOR BILE PIGMENT IN THE URINE.—Torday and Klier (*Deutsch. med. Wochenschr.*, 1910, No. 34). If 10 c.c. of a very dilute solution of azur-blue (1:10,000) are added to 1 c.c. of the urine, a green color results if bile pigments are present. The authors state that this is the most delicate of all known tests for bile.

PREPUTIAL ADMINISTRATION OF MERCURY.—Milian (*J. de Méd. et de Chir.*, January 25, 1910). The usual methods of administering mercury all have their disadvantages, since they either cause dyspepsia, are painful, dirty or inefficient. Milian advocates a new method. Four grams of blue mass, mixed with cocoa butter, is molded into a small rod. This is placed in the sulcus behind the corona glandis and the prepuce drawn forward again, thus holding it in place. It is stated that absorption is very rapid and that there is no irritation. In four hours, the ointment has usually been absorbed. It is said to be especially valuable in lesions of the penis.

THE TREATMENT OF ASCITES BY MEANS OF COLLARGOL.—Riehl (*Muench. med. Wochenschr.*, 1910, No. 21). Riehl reports three cases of ascites, one due to ovarian cyst and two to hepatic cirrhosis, in which collargol proved useful. The skin of the abdomen or of the back was thoroughly cleansed and from 3 to 4 grams of unguentum Credé were firmly rubbed in from fifteen to twenty minutes. In each of the 3 cases, the ascites disappeared, not to return until after a considerable interval of time. The good results of the treatment were apparently due to the diuretic action of the collargol, since in every case a marked increase in the amount of urine secreted was observed. Occasionally a watery diarrhea ensued and also aided in the elimination of the fluid. The number of cases reported is small, but if puncture of the abdomen can occasionally be replaced by so simple a procedure, the latter is certainly worth a trial.

THE SERUM TREATMENT OF TYPHOID FEVER.—Luedke (*Muench. med. Wochenschr.*, 1910, No. 23). Numerous attempts have been made to obtain an antiserum for typhoid fever, but none of them has proven satisfactory on account of the difficulty of obtaining a true typhoid toxin. Luedke obtained his toxin by digesting typhoid bacilli by means of pepsin and hydrochloric acid. This product was injected into goats in increasing doses and resulted in a serum with considerable antitoxic power. In order to render it also bactericidal, dead and later living typhoid bacilli were also injected. The serum so obtained, after having

proven satisfactory in animal experiment, was injected intravenously into patients suffering from severe typhoid infection. The dose varied from 10 to 20 c.c. In 9 cases so treated, the temperature rapidly declined to normal with a simultaneous improvement in the general condition. In one case, complicated by furunculosis and pulmonary tuberculosis, there was no improvement. In no case did the serum have any ill after-effects. Purely bactericidal serum and normal goat serum proved inert. It seems probable that a really efficient typhoid antitoxic serum will before long be elaborated. The theoretical difficulties have been overcome and it is now only a question of obtaining a serum of sufficient strength.

HORSE SERUM IN HEMOPHILIA.—Guibal (*Arch. prov. de Chir.*; abs. in *Muench. med. Wochenschr.*, 1910, No. 23). In connection with a case of hemophilia successfully treated by means of horse-serum, Guibal comes to the following conclusions. Hemophilia is not especially characteristic of northern countries, nor is it so rare in women as is commonly supposed. As bleeders often neglect to inform the surgeon of their ailment, he should never fail to question his patients on this point. In general, bleeders, especially those with a hemophilic family history, should be subjected to operation only if the indication for the latter is a vital one. In such cases, the surgeon should never neglect to inject hypodermically or intravenously from 10 to 20 c.c. of horse-serum the day before the operation. Fresh horse-serum is to be preferred; when this is not obtainable a corresponding quantity of ordinary diphtheria antitoxin may be used. There is usually no difficulty in obtaining fresh horse-serum, since every horse bears the withdrawal of 50 c.c. of blood from a vein without ill after-effects. The sera of other animals, such as rabbits, does not seem to be nearly so effective.

THE TREATMENT OF EPISTAXIS BY A SIMPLE METHOD.—Boyd (*Austral. Med. Gaz.*, 1910, No. 3; abs. *Therap. Gaz.*, 1910, June 15). * Take a piece of fine starched muslin 5 to 6 inches square. Impinge the points of a closed dressing forceps—a thin penholder will do—in the centre, and pull the muslin over the forceps, forming a closed umbrella appearance with the forceps as the handle. This is now passed through the nostril until it comes in contact with the posterior naso-pharyngeal wall, and the forceps is withdrawn. The ends of the muslin are now spread over the face and steadied in place by the fingers of the left hand, and the hollow cone now left is rapidly plugged from behind forward with small pieces of cotton-wood soaked in any available styptic, *i. e.*, vinegar—as firmly as thought desirable, the projecting ends of the muslin are trimmed off, and the little operation is completed easily in a couple of minutes. The second nostril is similarly dealt with if required. If it be not necessary to plug the postnasal fossa (doing the latter will almost invariably leave temporary deafness), the muslin cone, after withdrawal of the forceps, can be pulled forward to clear the posterior wall of any pressure before the plugs are introduced. The muslin should not be moistened, and the little plugs should be rapidly introduced before the cone gets flabby with moisture, as they slip in so much more easily.

THE DIAGNOSIS OF NEURASTHENIC PAIN.—Kollarits (*Deutsch. med. Wochenschr.*, 1910, No. 16). The muscular aches, the joint-pains and the back-aches of neurasthenic individuals often present difficulties of interpretation. On the one hand various rheumatoid affections, obscure cases of bursitis, spinal osteo-arthritis and the like are often wrongly dubbed neurasthenic, while, on the other hand, neurasthenic manifestations may be considered as indicative of a local organic lesion. Kollarits calls attention to a differential sign not found in the textbooks. Whereas rheumatic or other organic affections usually become aggravated on exertion, the sufferers from neurasthenic pain experience relief on moving about. In abdominal pain this may aid in differentiating an appendicitis or other inflammatory process from a neurosis.

In neurotic tachycardia and in pseudo-angina pectoris the same holds true, though less uniformly. In an attack of true angina pectoris the sufferer is nearly always rigidly quiet, as the slightest motion aggravates the pain. In pseudo-angina, on the contrary, we find the patient nervously pacing the floor.

These differences in the symptomatology suggest the proper treatment. In neurotic pain, instead of the quiet that is indicated in organic affections, the patient should be encouraged to indulge in moderate out-of-door sports. In pseudo-angina, or in nervous tachycardia, cardiac remedies, especially digitalis, should never be given. A symptomatic treatment—arsenic if the patient is pale or nux vomica if his appetite is poor—is usually followed by a disappearance of the cardiac symptoms.

THE DIAGNOSIS OF AORTIC INSUFFICIENCY.—Brelet (*Gaz. d. Hop.*, February 8, 1910). While the diagnosis of a typical case of aortic insufficiency is easy, atypical cases occur in which the recognition of the lesion is very difficult. Thus, the murmur instead of being blowing may be rough; it may be low-pitched and vibrating or high-pitched and musical. Occasionally it may be entirely absent. In this case the diagnosis must be based upon the size and shape of the heart, the location of the apex-beat, the Corrigan pulse, the capillary pulse, the double murmur in the crural space and other less constant manifestations of the lesion. Landolfi has recently described a new sign of aortic regurgitation which, while often absent, is almost pathognomonic if present. It consists of a rhythmic contraction and dilatation of the pupil independent of the will of the patient or of light. With each ventricular systole the pupil contracts, dilating with the diastole. The explanation of the phenomenon is simple enough, the contraction of the pupil being due to the momentary engorgement of the iris during systole and the dilatation to its abrupt emptying during diastole. It is, in a word, the manifestation of a capillary pulse in the iris.

A less striking, but more constant sign, is the so-called "choc en dôme" of Bard. This is best recognized by palpating the apex-beat by means of the ball of the thumb. In aortic insufficiency the apex of the heart can be felt to harden during systole in a circumscribed area of considerable extent, giving the feeling as though a ball or a dome-shaped mass were suddenly making its appearance under the palpating thumb. It is due to the ventricular hypertrophy and is most clearly felt when the patient lies on his left side.

DEATH FROM JONNESCO'S SPINAL ANESTHESIA.—Gabbett (*Brit. Med. J'l.*, March 19, 1910). Milward (*Brit. Med. J'l.*, March 26, 1910). Jonnesco makes the following statement in regard to his method of spinal anesthesia: "General spinal anesthesia is absolutely safe; it has never caused death nor any important complications." That this statement is exaggerated is shown by the reports of death due to the methods that are gradually finding their way into medical literature.

Gabbett's case is reported from Madras. His patient had elephantiasis of the scrotum but was otherwise well. Three c.c. of a solution containing 10 cg. of novocaine and 1 mg. of strychnine hydrochloride were injected between the twelfth dorsal and first lumbar vertebrae, with the patient sitting up. He then lay down and within ten minutes was anesthetic almost to the level of the clavicles. Soon after, he became nauseated, then dyspnoeic and suddenly stopped breathing. Artificial respiration was without avail. A marked rigidity of the muscles of the chest and arms suggests that death may have been due to the strychnine rather than to the novocaine.

In Milward's case—one of ileus—spinal anesthesia was used on account of the persistent fecal vomiting. With the patient in the recumbent position, 10 cg. of stovaine and 1 mg. of strychnine were injected into the spinal canal in the dorso-lumbar region. Some twelve minutes later, respiration had ceased and fifteen minutes after the injection he was dead. Artificial respiration and other efforts at resuscitation were used in vain.

A similar case was observed by the writer of this abstract some weeks ago. The patient had an enormous uterine fibroid that was causing such severe hemorrhage that operation was imperative. On account of a bad myocardium with edema of the lungs a general anesthetic was contraindicated, while the size of the tumor and the probability of extensive adhesions made the surgeon unwilling to operate under purely local anesthesia. A solution containing 10 cg. of stovaine and 1 mg. of strychnine was injected into the lumbar spinal canal. Some minutes later the patient ceased to breathe and died in spite of all efforts to revive her.

In all of these cases, surgical shock played no part. In the first case, none of the large vessels and nerves had been divided; in the second, the operation had not been begun when the patient died; in our case the abdomen had only just been opened. Such cases prove that as yet the method has not been rendered safe, if indeed it is capable of being freed from danger. For the present, at least, it should be used only where general anesthesia is contraindicated and where local anesthesia is not practicable. When used, it should be with the definite understanding that it may at any moment result in the death of the patient.

HISTORICAL NOTE.

PHILIP SYNG PHYSICK.*

The most interesting of all topics of writing is biography. In portraying the characters of individuals, elevated by their public station, we learn to trace the cause of their success or failure. If this is the case in respect of public men in general, it should be doubly so in regard to the profession of medicine. Medical biography has not taken its due place in the thoughts of the busy practitioner, who should at least know the principal facts and lessons of the lives of his great predecessors and teachers. The making of the lame to walk, the blind to see, and the deaf to hear were chosen as appropriate symbols of a Divine Mission; and we need scarcely observe, that, in the restricted sphere of human capacity, this is a portion of the mission of every conscientious surgeon. Of Philip Syng Physick this could truly be said. Throughout his life he possessed a soul alive to the miseries and sufferings of others, and exemplified that, in order for a man to become a great and good surgeon, he must be imbued with the best and kindest feelings of which human nature is susceptible.

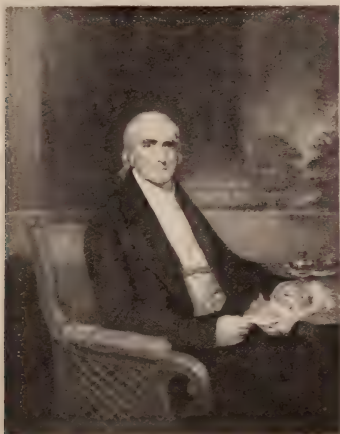
The "Father of American Surgery," Philip Syng Physick, was born in Philadelphia on July 7th, 1768. After taking his degree of Bachelor of Arts in the collegiate department of the University of Pennsylvania he commenced the study of medicine under Dr. Adam Kuhn, a pupil of Linnæus, and at that time professor of the theory and practice of medicine in that institution. For three years he continued his studies under Dr. Kuhn, and at the same time attended the medical lectures at the University of Pennsylvania, although he did not graduate there. For the more effectual completion of his medical education he went to England in November, 1788, with his father, who was enabled by his connections in London to put young Physick under the immediate care of John Hunter, at that time the most celebrated surgeon and anatomist of the day.

After a year under the patronage and influence of Hunter he was appointed on January 1st, 1790, house-surgeon to St. George's Hospital. In January of the next year he left there and received a diploma from the Royal College of Surgeons in London. During this time Hunter extended to him the warmest friendship and regard and conferred on him the invaluable benefits by giving him his powerful aid and influence and by promoting, by all means in his power, his medical researches. In accordance with a plan previously laid down for the completion of his medical education he took his leave of Hunter in May, 1791, and went to Edinburgh. The next year, having complied with all the requisites demanded by the University of Edinburgh he obtained the degree of M. D. The subject of his thesis was apoplexy, and, in accordance with established regulations, he was obliged to write it in Latin. In September, 1792, he returned

*Contributed by Mortimer Frank, B. S., M. D., of Chicago.

to Philadelphia and began the practice of medicine. The introduction of a young practitioner of medicine to the notice of the community was proverbially slow, and, as might have been expected, there were but few professional calls made on him during his first year of practice.

However, in the summer of 1793, Philadelphia had the misfortune to be visited with that awful calamity, yellow fever, which accorded him his first opportunity of proving to his fellow-citizens his entire devotion to his profession and his utter disregard of all personal considerations that might interfere with the discharge of his duties. In August, 1793, he offered his services to the Board of Health and was appointed physician to the yellow



fever hospital. On leaving the hospital he again engaged in private practice and the next year was appointed one of the surgeons to the Pennsylvania Hospital.

He had a sound, practical appreciation of the nature of wound-healing, and his first experiences were with the treatment of ulcers of the leg. The method of cure then resorted to was, for the most part, empirical and many limbs were unnecessarily amputated. He devoted himself especially to this class of patients and by rest in bed with the extremity elevated and by the use of proper constitutional treat-

ment he established a more correct and efficient method of cure. He was especially interested in the treatment of fractures, and his modification of Desault's splint for fractured thigh is still in use. He devised an appliance similar to that of Dupuytren for cases of fractures of the lower end of the fibula accompanied by outward displacement of the foot in Pott's fracture. In the branch of surgery now known as orthopedics he was very ingenious.

In the early days every surgeon was of necessity an ophthalmologist, and his favorite operation for cataract was that of extraction, giving it a decided preference over all the other operations, a step greatly in advance of his day. The last operation ever performed by him was for cataract, and took place a few months before his death. His operations on the eye, in conjunction with those for stone of the bladder, did as much in establishing his great surgical character as any that he performed. In 1805 a professorship of surgery was created in the University of Pennsylvania and he was appointed to fill the chair. In January, 1809, he performed an operation for the closure of a fecal fistula, which was a complete success, but owing to his negligence in not making a printed publication of the method at the time, Dupuytren disputed his priority.

Throughout his whole life Physick evinced an extreme reluctance to publish the results of his valuable observations and experience. In 1816, he published an account of the use of animal ligatures for bleeding vessels, which could be held secure for a sufficient length of time to cause their obliteration when the ligature became absorbed. In the same year, deeply sensible of his increasing infirmities, he resigned his surgeonship to the Pennsylvania Hospital after a service of twenty-two years. In 1819, contrary to his own wishes and inclinations, he resigned the chair of surgery in the University of Pennsylvania and was transferred to that of anatomy, which had been left vacant by the death of his nephew, John Syng Dorsey. The premature death of his nephew, and the above-mentioned circumstances, had the effect of creating a melancholy gloom, which overshadowed the remainder of his life. In 1820 he published an account of the removal of the tonsils by means of a wire snare, and subsequently devised a tonsillotome. In October, 1813, he performed lithotomy on Chief Justice Marshall. The case attracted great interest in consequence of the exalted position of the patient and his advanced age. On account of the immense number of calculi removed, upwards of a thousand, the case is almost unique in surgical annals. In other branches of genito-urinary surgery he was equally skilful. But the time came when all his activities ceased. For many months previous to his death he kept indoors, owing to his increasing feebleness. In December, 1837, he grew steadily weaker, and on the 15th of that month he passed into his long rest, "to where beyond these voices there is peace."

BOOK REVIEWS.

HANDBOOK OF ELECTRO-THERAPEUTICS. By William James Dugan, M. D., Lecturer on Electro-Therapeutics at Jefferson Medical College, Philadelphia; Physician-in-Charge of the Electro-Therapeutic Department and Assistant in the Out-Patient Neurological Department of Jefferson Hospital; Fellow of the American Electro-Therapeutic Association. With ninety-one illustrations. Philadelphia: F. A. Davis Company. 1910. Price, \$2.00.

So many handbooks have appeared upon this subject that one looks for the excuse of the appearance of another. The preface would indicate that the excuse in this case was the failure to include a discussion of *x-ray* therapeutics and diagnosis. But the author even fails to do this, as he inserts without reason an illustration and description of an inferior Roentgen apparatus with several poor *x-ray* pictures. With the avowed intention of discussing only electro-therapeutics, the insertion of such matter can only be viewed with suspicion.

The ambition of the author to promote the legitimate professional use of electro-therapeutics and the taking of this out of the hands of charlatans is worthy. But the use of illustrations labelled in large letters with the name of a manufacturer permits us to inquire into the motive of such a book when the reading matter does not present original electro-therapeutic measures.

This handbook of 242 pages is printed in clear type upon excellent paper. It provides a text descriptive of the use of galvanic, faradic and static electricity, together with chapters upon high-frequency currents.

The one novel feature of the book is an appendix, with topic discussion of electrocution, electric sleep, fulguration, resuscitation of electrically-shocked, test of death, etc. A summary of electrical treatment and a glossary occupy the last 35 pages.

This book will probably serve as a textbook for the author's classes, and for this purpose it is well adapted. It might also serve as a catalogue for a prominent electrical supply house. We wonder why this reputable publishing house will permit such unwarranted use of labelled illustrations.

PRACTICAL PATHOLOGY: A MANUAL FOR STUDENTS AND PRACTITIONERS. By G. Sims Woodhead, M. A. (Cantab.) M. D. (Edin.), Hon. LL.D. (Toronto), Fellow of the Royal Society, Edinburgh; Professor of Pathology in the University of Cambridge. With Two Hundred and Seventy-Five Colored Illustrations. Fourth Edition. New York: Oxford University Press. 1910.

This book is already well known to the medical public on account of former editions. Whether a fourth edition was necessary may be questioned as the third edition seemed to answer all purposes very well. New editions of books should be issued only when the additional material is important enough to warrant this procedure. Similar to the previous edition the colored illustrations which accompany the text are of a quality which cannot be too highly praised.

TEXTBOOK OF PATHOLOGY. By Joseph McFarland, M. D., Professor of Pathology and Bacteriology in the Medico-Chirurgical College of Philadelphia. Second Edition. Octavo of 856 pages, with 437 illustrations, some in colors. Philadelphia and London: W. B. Saunders Company. 1910. Cloth, \$5.00; half morocco, \$6.50.

What was said in this *Journal* about the first edition of Dr. McFarland's book may be applied to this edition. The arrangement of the different subjects is unchanged save that a number of interpolations, as the result of recent pathological work, have been introduced.

KLINISCHE DIAGNOSTIK UND PROPÄDEUTIK INNERER KRANKHEITEN. Von Dr. Adolf Schmidt und Dr. H. Luethje. Mit 211 Abbildungen in Text und 3 Tafeln. Leipzig: F. C. W. Vogel. 1910. Preis: 14 Mark.

In the flood of books on clinical diagnosis that are being published every year, a new book on this subject, in order to deserve special commendation, must not only in general attain a high standard, but must in some respects be of peculiar excellence. Both of these requisites are met by Schmidt and Luethje's new volume. In general it will be found an adequate presentation of the subject and in the discussion of diagnosis of gastro-intestinal disorders it far surpasses any other book with which we are acquainted. The description of modern methods of examining the stool is the clearest, most concise and most complete that we have seen. The gastro-enterological chapter alone makes the book well worth having. On the other hand, the chapter devoted to the circulation is curiously incomplete, and might well have been written ten years ago. The greatest stress is laid upon the diagnosis of the anatomical valvular lesion, a matter which is of comparatively little importance to-day, while the methods of investigating the condition of the myocardium are inadequately treated. Thus, the very important matter of beginning, partial, and complete heart-block is dismissed with a one-line reference to Stokes-Adams disease, and such matters as the model rhythm, auricular and nodal extra-systoles and functional cardiac diagnosis are not even mentioned. For the authors, the clinical polygraph or the Jaquet cardio-sphygmograph apparently have no existence.

This, however, is one of the few faults of an excellent textbook; one which, for its peculiar merits in other respects, deserves a wide circulation.

LEHRBUCH DER ARZNEIMITTELLEHRE, UNTER BESONDERER BERÜCKSICHTIGUNG DER DEUTSCHEN UND OESTERREICHISCHEN PHARMAKOPOE. Von Dr. H. v. Tappeiner. Achte, neu bearbeitete Auflage. Leipzig: F. C. W. Vogel. 1910. Preis: 8 Marks.

This is a thoroughly good book on modern materia medica, practical and at the same time scientific. It may be recommended to any one who desires an acquaintance with the German and Austrian pharmacopoeias. The only criticism one would be inclined to make is that the most recent advances in therapeutics find no place in the book. Thus the use of arsenical compound in syphilis, sleeping sickness and relapsing fever is dismissed with a line and no mention is made of any of the compounds except atoxyl and the cacodylates. Perhaps, however, it is as well that a book of this sort should confine itself to therapeutic agents that have been thoroughly tested and not found wanting.

ESQUISSES CLINIQUES DE PHYSICOTHERAPIE. TRAITEMENT RATIONNEL DES MALADIES CHRONIQUES. Par le Docteur J. A. Rivière. Paris. Imprimerie Bouchy et Cie. 1910. A. Maloine, Editeur. Prix: 7 fr. 50.

Dr. Rivière, who for many years has been an ardent champion of physical therapeutics, in this volume presents a condensed review of the entire subject. The first portion of the book treats of the use of electricity, light, heat, exercise and the like, while the concluding chapters discuss the application of these methods to various diseases. In general, it may be said, that the author's faith in the objective utility of the various applications of electricity—faradic, galvanic and high tension—is much greater than that of most American practitioners; hence, to our mind, his statements are somewhat enthusiastic. Nevertheless, it is certain that a great future awaits physical therapeutics, and, if critically read, this presentation of the subject will prove interesting and instructive. The general get up of the book is as poor as possible, and the volume shares with many other French publications the inexcusable fault of lacking an index.

UEBER DAS WESEN, DIE TECHNIK UND KLINISCHE BEDEUTUNG DER SERODIAGNOSTIK DER LUES. Von Dr. E. Scheidemantel. Wuerzburger Abhandlungen aus dem Gesamtgebiet der praktischen Medizin. Wuerzburg: Curt Kabitzsch (A. Stuber's Verlag). 1909. Price 85 Pf.

A concise but sufficiently complete presentation of the serodiagnosis of syphilis from the point of view of the practising physician.

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EDITORIAL.

THE STERILIZATION OF THE UNFIT.

As medical men a calm philosophy should be our daily mental habit. Though the currents about us,—and now we are referring to the multitudinous socio-medical subjects which have the bad manners to insinuate themselves just when we do not desire them,—are seething as never before, our judgment should always be our best asset, for if we lack this prime quality our very human attributes will impel us headlong into various matters which really belong more to the sociologist than to the physician. These words are not written in aught but seriousness, since it must be apparent even to the most superficial observer that the medical man of to-day is far-reaching in his desire to solve all sorts and conditions of problems, the tendency of the times being to cast into the medical dust-heap many vexed questions which have enjoyed years of wrangling from innumerable philosophers and sociologists without the first glimmer of a solution. But though an unconquerable ambition always counts for much and should not be flouted on account of its occasionally noisy manifestations when translated into speech, it has this drawback, that having lodged its fangs in the brains of the commonplace or the somewhat talented, it is soon metamorphosed into an obsession that breaks off all alliance with reason. Now of all the problems with which the medical man has latterly wrestled with a strength that must invite praise, none has engaged his attention so thoroughly as the sexual question; and though very few of its intricate involutions have as yet been satisfactorily disposed of, his ambition is just as unfrayed as it was before he met with unexpected obstacles, if we are to judge by the alacrity

with which he has transferred his many-faceted thought from the subject of social and moral prophylaxis to that of asexualization.

In one of his best essays Chesterton says, that when Jones begins to worship the Inner Light he generally ends by worshipping Jones himself; a statement that can easily be paraphrased so as to apply to that section of medical writers on the subject of how best to stop degeneration, who worship themselves—their egoism, their beloved theories—with no thought as to how impracticable are their lucubrations. And this is being done at present despite the bitter lessons which were taught us after our docile march in the wake of Lombroso's fulminations. Of course we are not so narrow-minded that we cannot see that the matter of degeneration is an important one; that it has the fascinations that cannot but attract a medical mind who would rather grope in darkness, in the hope of ultimate light, than broach an obvious question; that it can be attacked from all sides and therefore is dependable food for many theorists; but even though we grant all this with good grace, we yet remain restive when we read of the lengths to which many medical writers go, when their ambition impels them to put into print words, which, if they were to get abroad among the laity, would work havoc with the remnant of personal liberty that we are desirous of conserving.

A case in point is the paper, "The Value of Surgical Procedures in the Solution of the Problem of Race Betterment," which Dr. J. Ewing Mears contributes to the *Medical Record* of August 13th, and in which he advocates castration in preference to vasectomy, because the sexual pleasure is not completely annihilated when the simpler operation is effected. His contention, as we have read it, amounts to this: While vasectomy puts a stop to procreation, the degenerate is still in possession of the much-desired "pleasure," and so long as this enviable attribute obtains, his degeneration will go merrily on whether the operation is performed before or after perverted manifestations. However an entirely different phase is put on the matter when castration takes place, for even though it is done after many outbursts of sexual abnormality, the degenerate reforms to such an extent—thanks to the entire abolition of the sexual sense—that he is no longer companionable in certain circumstances; hence, he cannot continue his life of degeneracy.

While all that Dr. Mears says is true, his advocacy of an extreme measure must be censured, not because we doubt for a moment his sincerity, his honesty, but because in advancing his views his enthusiasm has beguiled him into a forgetfulness of the difficulties which stand in the way of a clear and definite interpretation of degeneracy. It is easy

enough to say that a certain class of rapists, imbeciles and the vicious insane are degenerate, and that an operation to stop the powers of procreation or vanquish sexual enjoyment should be instituted; but the betterment of the human race cannot be effected thus, since the contents of our institutions represent only a fraction of the degenerates abroad in the world. We have no statistics at hand to substantiate this statement, but according to what is talked about "over the teacups," when physicians forgather, our statement cannot be wide of the mark. Now if once Dr. Mears' theories, or anyone else's, take root in the rich soil with which physicians broider their conversation, can anyone predict what enthusiast amongst them will not be inflamed enough to advocate an operation on what he conceives as an excellent specimen of the degenerate class, not only in the presence of his intimates, but also in promiscuous crowds, for even physicians are prone to talk too much when the "unconquerable ambition" to solve sexual problems is upon them. And the waiting public is always at hand, eager to snatch up the slightest morsel wherewith to impale a fellow-citizen, and ready to tear to tatters the personal liberty of the individual whose private life has been exposed by a physician.

Who are the degenerates? Who are the Unfit? Until recently we had thought that the offspring of drunkards must necessarily present physical and mental impairments and a moral obliquity that could not be construed otherwise than as undoubted degeneration. We were so cock-sure of this, that when the subject came up in general conversation the flow of our language had all the attractions which come from a deep knowledge of the subject and the many metaphors with which we did not hesitate to punctuate, where pauses were deemed most effective. But to-day we know that our certainties, in regard to the heredity of alcoholic stigmata in the shape of weak constitutions and subnormal minds, are a bit wobbly, for the searching report prepared by Miss Elderton, of the Galton Laboratory of Eugenics, with the assistance of Professor Karl Pearson, makes clear to us that not only are the children of drunkards, as found in the working-class districts of Manchester and Edinburgh, the equal, as regards physique and intelligence, of the offspring of sober parents, but they are their superiors, as regards height, weight, general health and eyesight. The fact that the parents of these children may have been the victims of an acquired habit does not militate against the contention so firmly implanted in the minds of many physicians and the educated element among the laity, that drunkenness cannot but breed a stunted growth in children, and that if there are a handful of people who agree with Weissmann that an acquired habit cannot be inherited,

their own observations are the only correct ones, since the first step downward towards degeneration can without fail be traced to a drunken ancestry.

Already the words "degenerate," "pervert," and "unfit," too readily spring to the lips of those who wish to make a show of their learning; and though there may be a number of medical men who discountenance the habit, there are enough and to spare who by example abet the utterance of these stinging words. Their thoughtlessness, to put it mildly, cannot but blaze a trail in the rank and file of a people that may be productive of great harm, since there is no telling what the uneducated enthusiasts may not divine, in the matter of degenerative stigmata, in persons who for some reason or another have incurred their displeasure. And when popular imagination is further incited by the undigested reading of reports of cases in which asexualization was enforced, a lawlessness may arise that will have small respect for personal liberty.

THE PROBLEM OF TYPHOID PREVENTION.

The discoveries as to typhoid fever in the last few years have shifted the problem of prevention upon the country practitioner. It has long been known as "the traveler's disease" and in one city an investigation of the cases arising in September, 1909, showed that fifty per cent. had recently returned from a vacation. If only one-fiftieth of a city's population takes a pleasure trip in August, the figures show that each of them has twenty-five times more chance of contracting the disease than if he had stayed at home. These facts are placed in a new light by the final realization that each case arises from a more or less intimate contact with a prior one. Those who nurse the sick furnish eight times more cases relatively than those who are not in contact. Moreover the most contagious period is probably in the early days even before the symptoms are marked enough for a positive diagnosis.

In Germany it has been shown that the disease is endemic in places where all the water supplies are safe and pure, but that the cases can so often be definitely traced to contact with a prior one, as to raise the suspicion that all are so contracted. That is, a very short period exists between the time of extrusion of the bacilli from the sick and their entrance into the bodies of the well. The organisms are so delicate that they will not survive very long in water, as a rule—a time measured in weeks, or even days, though there are instances which point to continued virulence after months. In most cases where a water supply is

the medium, there is generally evidence of a very quick transfer. Though the necessity for uncontaminated water is just as great as ever, yet the large number of cases still arising in cities which have improved their water supply, proves that the other means of transferring virulent bacilli are even more important.

The modern crusade against typhoid is, therefore, based on the assumption "that the disease is highly contagious" and "measures for early isolation and disinfection must be rigidly enforced." It has been shown for instance that when several cases occur in one family, they often follow one another at regular intervals as though contracted from one another. Progressive countries are even passing laws compelling the isolation of all typhoids and the health authorities are busy devising methods to insure an early diagnosis. In the meantime good practice demands that where the disease is endemic, every fever must be considered typhoid until it is proved to be something else, and the most extreme precautions taken to prevent its transfer to others. Since the disease is really a country one, and as most of the city cases can ultimately be traced to the country, it is evident that the problem of eradicating it is really in the hands of the country doctor. The number of proved instances in which the bacilli have been carried to the city in milk or other farm products, shows that until laws can be devised which will place the situation under control, sanitarians cannot possibly prevent the introduction of the bacilli into the city from places now devoid of proper control.

The large number of chronic carriers being constantly discovered, still further complicates the matter. Convalescents should all be considered carriers, although many of them react so promptly that the bacilli are soon dead or, if living, are so injured as to be incapable of further damage. A certain unknown percentage of cases are not so fortunate, but establish a tolerant immunity to the invaders which thereupon take up a more or less permanent residence chiefly in the gall bladder. It is now suggested that if bacilli are still found after twelve weeks, the patient be considered a chronic carrier more dangerous than a leper. The enormous destruction of life due to contact with these unfortunates, renders it necessary to place them under control, but what kind of control is possible has not yet been decided. Unfortunately no way has yet been devised of curing them, though doubtless a serum or vaccine will be found in due time, and the present problem is to prevent their spreading of the disease. In European countries where sanitary organization is very thorough, it has been found possible to allow these men to continue ordinary labor, except, of course, the handling of foods of others, and by the use of individual eating utensils and the careful disinfection of excreta in a separate closet, spread of bacilli has been prevented. Such control in

America is now utterly out of the question. The carrier is a free born American citizen who can kill whom he pleases without restrictions on his personal liberty. Nevertheless, there seems to be a movement towards legalizing the confinement of carriers until they are no longer a menace to public health. Indeed confinement is already possible in some localities under existing statutes or the common law as to public welfare.

At present it is expecting too much of human nature to count on reports from physicians, particularly where such might result in the confinement of a member of a family long attended. No young physician would retain his practice if it were known beforehand that he might be the means of depriving the patients of liberty for a long time. Even now it is found impossible to obtain reports, so that quite a large percentage of typhoids do not appear on the statistics, and the calculated death rate is unduly large. The only course to take is in the direction of educating the public so that it will be widely known, at least by the intelligent, that typhoid is entirely preventable if they will only coöperate. When a proper public opinion is created, it will be possible to impose severe penalties for failure to report cases. The frequent epidemics in hospitals for the insane have been shown to be mostly due to contact with a carrier admitted as a patient, and where isolation of new cases has become the rule in advanced institutions the epidemics have been prevented. Equally good results would follow in the general population, if we could only isolate these carriers.

The main difficulty will be the making of the diagnosis early enough, for few country doctors can possibly establish laboratories nor have they the time or skill to use them. Almost every city is well fitted out with public apparatus and skilled workers, and there is positively no excuse for failure to make an early diagnosis there, so that the health authorities should already be able to get track of every case, provided the genreal practitioners will only coöperate. This cannot be expected until we cease the dangerous practice of labeling mild cases with some non-committal name such as "biliousness"—a practice still continued in certain places in spite of the denunciations of a whole decade. Even in Germany, where accuracy is much more possible, an investigation of a little district a few years ago, revealed 72 cases, many in children, where only eight had been reported. It is a matter for state health authorities to take up, and arrange a system of laboratories in many parts of the state so situated that it will be convenient for the country doctor to send specimens for bacteriological study and receive prompt reports. The complaint frequently heard is to the effect that reports from present laboratories are not received until the diagnosis is evident. The only course to pursue is to consider all fevers as typhoid until a positive diagnosis is made—a rule much more necessary in the country than in the city.

OPINION AND CRITICISM.

FLORENCE NIGHTINGALE: AN AFTERTHOUGHT.

The panegyrics on the life of Florence Nightingale, which have resounded through the lay and medical press since her death, illustrate what hysteria is capable of, when the public conscience is pricked by its own misgivings on account of an inexcusable negligence which was apparent to every unbiased "looker on in Vienna" during the lifetime of this remarkable woman. Before her death, how many of us knew that she was still alive or that England was housing an individual who, at the moment of her death, would be the cause of opening the flood-gates of sentiment and balderdash through which so steady a stream of "repetitious" platitudes would flow, that even some months after the cataclysm a number of piping voices would refuse to be stilled? Yet what is written here is no exaggeration of what is now taking place in the columns of our weekly and monthly journals, so that amends may be made for an attitude of indifference that had all the earmarks of the Anglo-Saxon way of regarding the living.

In all the medical journals great stress has been placed upon the fact that Florence Nightingale belonged to the Order of Merit, the inference being that the medical world demanded this coveted honor for one whose services could never be forgotten. Truth to say, at the time this honor was conferred upon her, not one physician in a hundred had ever heard of her, or, having heard her name, knew what she had done for the English during the Crimean war. In fact, if it had not been for a small number of literary men in England, who felt that the aged heroine of Scutari had been slighted by the Government and the people on account of an indifference that had consigned her to an almost complete oblivion, no compensation in the way of a decoration would have come to her. But the clamor raised by that small band of literary enthusiasts did more than fetch her a highly-prized badge: it brought her name before the public—for a few hours, it is true—but still in a way that made appeal to all those who vaunt one's virtues according to the value the head of a government places upon them.

Florence Nightingale's career, at least the stressful years which most interest us, is a chapter that could be entitled, *The Hour and The Woman*. With her small knowledge of nursing, but with an indomitable will, she faced, when she left England with her small number of faithful followers and arrived in the Crimea, a state of things that would have driven discouragement to any weaker woman's heart. But the brawn and fibre in her make-up made short shrift of obstacles; in fact, mowed them down as if they were mere stubbles too insignificant to contemplate.

When we recall how carefully the modern nurse is reared, and what attention her mental training receives, and how her nurturing goes on until her sensitiveness rebels against the least obstacle in the sick-room, and then think of one, like Florence Nightingale, who really courted dangers and obstacles and made light of the low lights in the art of nursing, a correct estimate of the woman is attained. Her nursing may have been crude even for those times, but the crudities were not sufficient to stay the hand in its right course; her mastery of the special work to which she dedicated her serious thought may have been the sort that only the inevitableness of circumstance can teach; but the gift of doing was greater than can be got from any school, be it never so thorough, for here was a case of the woman first, and the nurse after. In our modern conception of nursing it is the nurse first, and then the woman; hence the results.

LITERARY NOTES.

In his Lille thesis for his degree of doctor of medicine, Dr. Lorthiois treats in an interesting manner the subject of automutilation, of which there were many occurrences in former times, though even to-day among the alienated the matter is often brought to our attention. This thesis is out of the ordinary in so far as it is a collection of strange facts which, though found here and there in various books, have never until now been gathered in one work. Besides the industry incident to the gathering of the unusual data, the essay evidences considerable literary charm; a fact that should not be overlooked in any book, but especially noteworthy in the writings of medical men on account of its unusualness. In the fourth century before the Christian era, Anaxarchus, a Greek philosopher of Abdera and a disciple of Democritus, having made many enemies on account of his frankness, incurred the hatred of Nicocles, the tyrant of Cyprus, who ordered him to be beaten in a mortar! Perhaps on account of this humiliating form of punishment, Anaxarchus persisted in further insulting the tyrant. At last, as the most exquisite sort of torture that Nicocles could devise, he threatened to have Anaxarchus's tongue torn out if he continued his insults. The disciple of Democritus replied: "You cannot do it, O monstrous weakling!" and before many minutes had elapsed, bit through his tongue, severing it at once and spat it in the face of the tyrant. Zeno of Elea, son of Teleutagoras, and the inventor of "dialectic," instigated a plot against Demylos of Elea, for which he was traduced and delivered into the hands of this tyrant. Whilst undergoing the most cruel tortures he was asked to tell who his accomplices were, and having named all the friends of the tyrant, as well as the tyrant himself, he made his defiance more insulting by biting his tongue in two and ejecting it into the face of his torturer. In the year 322 B. C. the Athenian orator, Hyperides, was condemned to death for supporting Hellenic liberty and opposing the Macedonian party. Fearful lest the tortures to which he would be subjected would weaken him into

telling certain secrets, he at once mutilated his tongue beyond all use. But though the cases which have been cited would lead the reader to imagine that the tongue is the special organ for mutilation, such a conclusion would not only be hasty but wrong, for if we read farther on we learn that other members of the body have not been neglected. For instance, there is the much-discussed case of Pope Leo I. The versions, which have been advanced in regard to the disappearance of his hand, have really more to do with the question whether the offender, who deeply chagrined the pontiff by kissing his hand, was a worldly woman or an unworthy man, and not with the fact that the hand soon after this dire incident was not seen for some time. But even granting that the hand thus made unworthy was no longer fit company for the rest of the pontiff's body, and that it was right and proper to cut it off, our medical interest in this special case of self-mutilation is somewhat weakened on account of the legend which says that, although there is no doubt that the hand was cut off, a miracle took place and the hand grew again! The anecdote which Dr. Lorthiois relates about St. Ebba is not without interest, for it shows most decidedly that self-mutilation, painful though it be, does not come in for many rewards. This special saint was abbess of a convent. Hearing that the Danish invaders, Stuba and Hinguar, were about to invade Ireland and lay waste the entire country, and fearful that a worse fate than fire and sword was in store for the nuns in the convent, she ordered them to disfigure their faces by cutting off their noses and their upper lips! One would think that such voluntary mutilation would stay the hand of any enemy, but no doubt the disappointment of the Danes was so great that they thought further punishment was necessary, so they at once set fire to the convent and all its human contents, thus showing their disapproval of self-mutilation.

"Superstitions and empirical procedures, more or less ridiculous and dangerous, obtain in all countries to-day; hence it is not in a spirit of irony that I write of the same defects among the Spanish," says Dr. A. Gaullieur L'Hardy in the *Gazette des Hôpitaux* of June 30th. To show with greater emphasis that he is not narrow in his views and that no such thing as Gallic prejudice has influenced him in the expression of his opinions, the author substantiates his statements by referring the reader to the interesting paper, on the superstitions existing in Spain relative to the new-born and to recently confined women, which appeared in the *Gaceta medica Catalana* on February 15th and March 15th, 1910. When a child is born that is apparently dead what means should be used to resuscitate it? There is nothing else to do, according to certain so-called Spanish authorities whose word is law among the uneducated, than to burn near the child the placenta and a piece of the umbilical cord, at the same time driving the fumes towards the child's nostrils. Another highly recommended procedure consists in introducing tobacco smoke into the rectum by means of a lighted pipe! In a number of villages in the provinces of Lerida and Tarragona, it is not uncommon for some wise-

acre to introduce into the anus of an asphyxiated child the beak of a living fowl. Another method is to practise suction of the left nipple, a performance that is without danger provided the practicer has no contagious disease, and which, moreover, has the advantage of stimulating the nerve plexus of this region. When it is a question how to cleanse the child, popular imagination soars high. The first step is to bathe it in a white wine, then anoint it with oil, and finally completely cover it with the skin of a hind or a wolf. To render the child robust, its head and chest are sprinkled with blood from the umbilical cord, a procedure that must certainly deprive the child of a considerable amount of blood which otherwise would be carried into its system. An ancient custom that is vaunted both by Galen and Avicenna is to sprinkle the new-born with salt. The famous operation known as cutting "the string (frenum) of the tongue" is still very much in favor with many Spanish matrons and to effect it the finger-nail is used. One can readily understand that an infection quite often follows this primitive procedure. The kneading and brutal compression of the head, to the great damage of the nerve centres, under pretext of rounding off any edges which the child's head might have, may be mentioned here, but what is more important because the practice occurs only too frequently is the application of a plaster consisting of oakum, brandy, the whites of eggs and many other substances to the child's head in the hope of closing the fontanelles. The compression of the ears by means of the handkerchief, the traction of the nose to prevent its becoming flat are things common in all countries, but what is not so common in other countries is the friction of the gums of the new-born with a gold coin so as to conserve for all time their pristine redness. For this delicate operation to reach a high state of perfection it is necessary for the coin to remain in possession of the child's god-mother! When the women quit their extraordinary work on the child's mouth, the anus engages their attention next, and here their interference is no less remarkable. Their justification for manœuvring around these tender parts is "to make an anus," and to this end they introduce the little finger which has been previously immersed in oil. By doing this they hope to provoke a rapid expulsion of the meconium. In Navarre a similar desire to help the child obtains among the people, but in this province other means are used—namely, small sugar-coated pills containing aniseed! Sometimes well-oiled paper suppositories, a sprig of parsley, or a paste made of a mixture of oil and the soft parts of the excrement of the fowl is used. The growth of the child is made subservient to a number of absurd beliefs. Some are of the opinion that by rubbing the child's finger-nails its growth is assured; others hold that the same end is attained by passing the leg above the child's head during sleep. A special belief has it that if, during the period of lactation, the parents wish to know how tall the suckling will be when full-grown, all that is necessary is for them to hold in their arms as many grains of corn as possible, and enlightenment most unusual will be theirs, for by placing the grains one next to the other the simple (?) process will foretell what the years to come would fain keep as a secret.

ORIGINAL ARTICLES.

THE TREATMENT OF CANCER BY RADIUM.

By DR. LOUIS WICKHAM, Director of the Surgical Department at the Radium Laboratory of Paris, in Collaboration with Dr. P. Degrais, Chef de Laboratoire at the St. Louis Hospital in Paris.

The advantages, of which radium-therapy can boast when applied to the treatment of cancer, proceed from a combination of the following factors:—

(1) The possibility of increasing the quantity of radium to any amount at will. In fact, the methods of application at present at our disposal can be united so as to give the patient the benefit of from 50 to 60 cg. of pure radium, though this does not mean that in the future the amount will not be increased.

(2) The great quality of penetration on the part of the hard β and γ rays, which makes them greatly superior to the penetrative powers of the x -ray.

(3) The possibility of concentrating these radio-active forces in methods of application extremely convenient to handle; the operator having the choice of the method. The amount of radium may be so small that it can be introduced, by means of a bistoury, into artificial openings, into tumors or into the natural orifices in various parts of the body.

These three factors are absolutely peculiar to radium. If one compares them with those offered by the x -ray, one will immediately recognize the shortcomings of the x -ray to be as follows: (1) The difficulty of increasing in an indefinite manner the quantity of free rays; (2) the lesser power of penetration on the part of the rays; and (3) an apparatus that is difficult to handle.

When I state that the qualities peculiar to radium-therapy, which I have set forth, can be regulated and modified by special techniques, such as filtration, of which I am the originator, by my method of "cross-firing" and other methods, one can readily comprehend the therapeutic agent, supple as well as strong, that is contained in radium. But what really makes radium a therapeutic agent especially important and subtle, are the following:—

(1) Besides the superficial parts that radium can destroy in the manner of any caustic, the rays pass deeper into certain pathological tissue,

and in a special manner which I have called the selective action of radium. By carefully limiting the action of the rays, they attack certain pathological cells, modify them in their morbid action, and at the same time do not affect the healthy cells.

(2) In employing certain methods which I have established, a deep and extensive selective action can be produced without leaving any trace of a surface burn.

Hence, by means of radium we can, either by destroying the subcutaneous layers or by not destroying them, reach the deeper layers so as to modify certain tissues by a selective action. Among the tissues which are thus favorably modified are the angiomatous, keloid and eczematous; but of all the tissues which are affected by radium, those which make up malignant tumors are undoubtedly selected by it for its best action.

In describing the technique used in the treatment of cancer by radium, and the results following treatment, we shall mention only those facts which are the most interesting and certainly the most useful in connection with the study of radium-therapy.

What, then, has been my method in the radium-therapy of cancer which I have employed in collaboration with Dr. Degrais for a number of years at the Radium Laboratory of Paris? To begin with, I contend that since the action of radium can have only a local effect, as often as a cancer can be completely extirpated by surgery without mutilation, I have preferred unhesitatingly surgical intervention, not because radium is of no value in such cases, but simply because it would be unwise for the advocates of radium to stand in the way of a complete extirpation which is often the best procedure. Moreover, once the operation is performed, radium is an excellent adjunct, since its rays are capable of attacking areas beyond those removed by the knife. Again, in those cases in which surgical intervention has been delayed, either on account of the highly probable mutilation which would have resulted, or because the knife could not reach sufficiently beyond the malignant area, radium, similar to other auxiliaries used in surgery, such as electricity and the *x*-ray, should be regarded as an aid of considerable merit. In some cases of cancer, radium is the only reliable auxiliary at the command of surgery. Hence, the greater reason for saying that radium should be used in cases that are altogether inoperable. Such are the general principles I have practised. I will now proceed to select, from the various cases which I have treated, those in which radium incontestibly shows its usefulness as a therapeutic agent and its superiority over other methods of treatment of lesser value.

A physician consulted me in the beginning of October, 1909, in regard to a malignant neoplasm of the neck of the bladder, presenting all the usual symptoms of a morbid growth: hemorrhage, discharges, frequent micturition, intense pain, and hardening of the prostate. By means of the urethroscope the diagnosis was confirmed. Dr. Pasteau, the urologist,

after mapping out the diseased part, passed along the urethra a rubber sound, to the extremity of which had been attached a radium tube, and inserted it in such a way that the radio-activity was directly in contact with the tumor. At regular intervals, in the course of three months, a tube containing 5 cg. of pure radium was each time left in contact with the tumor for an hour. This was done twelve times. Such was the method which was adopted. I cannot here enter into the details of the technique, but the results were better than had been anticipated. In fact, ten months after the beginning of this treatment, our confrère was apparently in good health with none of the troubles that he had had before. This is an example of the utilization of a natural orifice, and by analogous procedures we have obtained very favorable results in some cases of cancer of the rectum, in which the growth was too high to be operated, as well as in cancer of the esophagus. Before this sort of treatment is invoked, I would suggest that one first consult a specialist who is accustomed to the use of the endoscope. This is a precautionary measure that makes for the perfect application of the radium apparatus. What the dosage of the radiation ought to be is not an unimportant point and can be acquired only from a study of the therapeutics of radium.

An altogether different matter is the manner of the application of radium after a surgical operation, as it is necessary for the physician who uses radium to be familiar with those orifices which will permit it to be introduced as far as the flat surface of a tumor. In this way I have treated cancer of the larynx in an upward direction; cancer of the intestine in a downward direction after kelotomy; and a cancer of the pylorus, of which the history follows:—

Labey, the surgeon, performed a gastro-enterostomy. But instead of closing the wound in the stomach, he left it partly open and in this opening the tubes of radium, by means of a curved sound, were placed in contact with the cancer. At the same time I placed on the abdominal parietes the other apparatus so as to get "cross-firing" of the rays between the inner and the outer apparatus.

Thanks to radium, even in accessible but wholly inoperable cases, surgery is not without value, for by perforating tumors to their depth with a trocar, a means is evolved by which many tubes of radium can be introduced into the openings. These perforations are so many points through which the radio-active strength may be conducted in all its intensity, even down to the bottom of a neoplasm; while synchronously other methods may be applied to the surface of the neoplasm, so as to combine the radio-activity in the deeper tissues with that in the superficial tissues.

The interior appliance, lying in direct contact with the tissues, allows the greatest number of rays to pass, whereas the exterior appliance is separated from the skin by metallic plates of lead $5/10$ of a mm. to 3 mm. thick, so that the rays which have only a feeble penetration are intercepted, while, on the other hand, the rays of great penetration, the hard

β and γ rays, are not interfered with but are allowed free play. In this way the length of the application in relation to its radio-active intensity can be gauged so that no burn of the surface ensues. This manner of applying radium—combining the emaniferous with the radiferous method—was followed by me in the treatment of an enormous tumor in the parotid region, that projected 5 mm. above the surface, was traversely 9 cm., and measured to its highest point 11 cm. The growth was a lobular epithelioma with nodules; hence, one of extreme gravity. It was firmly implanted at the base and absolutely inoperable. Treatment was commenced in August, 1908, and at the end of five months, after many applications and the use of a large quantity of radium, the tumor disappeared. This apparent cure lasted nine months; then a relapse occurred which we are combating at present.

Surgical intervention should be invoked in other cases in which the complete extirpation of an accessible but inoperable tumor cannot be accomplished. After the operation, the radium apparatus is placed as far into the wound as possible. Where this has been done I have observed that a patient who would undoubtedly have succumbed, according to all appearances, at the end of two or three months, was after eleven months in an excellent condition so far as the involved cervical region was concerned. Unfortunately, a metastasis occurred in the pharynx, which soon caused death.

Divers surgical interventions, such as perforations, partial excisions, and incisions, succeed in diminishing the pathological thickness of growths and permit a greater action of a larger number of radium rays extending to the very limits of the neoplasms. In a recent case of cancer of the breast (atypic lobular epithelioma), which I saw with Drs. Degrais and Gaud, there were such histological changes in the growth that no doubt could any longer exist of the effect which large doses of radium (19 cg. during forty-eight hours, inserted to a depth of 9 cm.) had in causing retrogressive modifications. Hence, it can easily be understood that an increased amount of radium is more effective; but since the number of rays which are concentrated at the same point is an important factor that has considerable therapeutic *raison d'être*, the thought should not be lost sight of that it is always necessary to diminish the thickness of a cancerous tissue which is to be treated; at least enough, so as to allow the growth to be more completely inundated with the rays up to its boundaries.

In the preceding paragraphs, the cases cited illustrated to what extent surgery aids radium; in the following cases the reverse will be shown—namely, radium coming to the aid of surgery. For example, if a surgical extirpation cannot be made on account of untoward conditions, radium applied before the operation lessens the destructive process in the parts involved, and renders operable, tumors which were not so before. Finally, there are a number of cases—cases of extreme gravity—in which surgery cannot intervene, but in which radium, without producing a par-

ticularly beneficial result, can at least relieve patients during long and tedious periods of pain (analgesic action of radium) and lessen hemorrhages and secretions.

After what has been said on the subject, it is not difficult to comprehend that the special organ for radium-therapy is the uterus. In fact, in cancer of the uterus, when it is employed before surgical intervention or simply to relieve the patient, radium plays a most useful rôle. The same result obtains in advanced cancer of the breast.

So far mention has been made only of those cases in which radium is a unique adjunct to surgery, and I have intentionally left for my last remarks the advantages accruing from its use in cancerous growths of the skin and the eye-lids; facts which are well known and well established. In other words, now that the end of this article has been reached, the affirmation should be made that radium-therapy must not be regarded as a means destined to cure patients afflicted with serious cancers, but may be employed by itself or in combination with other means to relieve the sick and prolong life during a period long enough to compel the thought that, at least, an apparent cure has been effected. Even when cures are absolute—results which I have obtained relatively often—a relapse in the shape of a metastasis may take place.

Of all the malignant tumors, the giant-cell sarcomata are the most favorable to treatment because they are local. Moreover, in these cases the word "cured" is every now and then permissible. On the other hand, the lymphosarcomata, though they rapidly recede under the action of radium, are unfortunately only too often followed by a metastasis. Of all the lobular and tubular forms of epithelioma, those that are found in the mouth are the least tractable to radium. Nevertheless, even in these growths of the buccal cavity, the malignant elements occasionally subside as by "*le coup de fouet*."

My complete researches on the action of radium in malignant tumors have taught me that in radium we have a means of undoubted value for combating obstreperous growths; and since physicians and surgeons to-day are so poorly equipped to wage war against cancer, a new agent presenting effective and special qualities of action, even though these be limited, should be regarded by the medical profession as a veritable benefaction in the treatment of malignant neoplasms. This achievement, in my opinion, should suffice when praise is bestowed on Becquerel, Curie, Ramsay and Rutherford for their great discoveries.

4 Rue St. Philippe du Roule.

LATEST PERSONAL EXPERIENCES WITH THE EHRLICH-HATA REMEDY (606) IN THE TREATMENT OF SYPHILIS.

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Ehrlich was among the first who obtained results of far-reaching importance in specific therapy, that is, in the direct and indirect treatment of diseases with substances obtained from bacteria. He soon recognized the fact that the activity of the natural healing powers of the organism is seriously hampered by the very nature of the infecting parasite. Hence, it became Ehrlich's endeavor to ascertain the remedies which would have the virtue of destroying the parasite in a direct manner without any serious impairment of the organism. Experimenting on animals he attempted to find, among the numerous derivatives of a certain remedy, the one which offered most favorable results in this respect. His investigations, in connection with a large number of arsenical preparations, yielded the following results: for infection with a trypanosoma, arseno-phenylglyzin was successful; for infection with spirillæ, the dioxy-diamidoarsenobenzol as prepared by Bertheim. Hata observed that within twenty-four hours the latter remedy eliminated all the parasites from large primary ulcers swarming with spirochætæ on the scrotal skin of rabbits and caused these ulcerations to heal rapidly. This remedy was so little toxic for animals that 0.15 per kg. could be injected into monkeys without harmful results. Later on Alt proved by experiments on paralytics that the substance was just as harmless for the human being. Splendid results have been obtained by Iversen in recurrent-infection and also by Schreiber in syphilitics. Nevertheless, there remained a pronounced hesitation against the use of any new arsenic preparations and it was generally felt that a chance could be taken with these substances only in apparently incurable cases of syphilis. For this reason I decided to begin experiments on hereditary syphilitic new-borns with pemphigus syphiliticus, in which all the internal organs always are so thoroughly permeated by spirochætæ that almost without exception they soon succumb to the infection. I succeeded in saving the life of such children by means of the new remedy. Perfect cures also were obtained in cases of most malignant types of syphilitic infections which have proved refractory to every form of treatment and seemed to offer an absolutely hopeless prognosis. I may mention a few examples:—

1. Willy D., eighteen years old, in 1906 first came under my observation with a malignant type of lues which did not heal under calomel in-

jections and a regular course of treatment with a Zittmann mixture. He later entered the Virchow Hospital with the following lesions: Large syphilides on the body, ulcerous necrotic processes of the pharynx, swelling of bones and eight deep ulcers, the size of peas, on the lower side of the glans. He was given an inunction treatment, saiodin, calomel injections, arsenic (both hypodermically and in form of *pilula asiatica*) vapor baths, sulphur baths, and potassium iodide. Since February, 1907, often for weeks at a time, his temperature would rise to 39° C. and difficulty of swallowing necessitated the application of anesthesin. In March two courses of inunction treatment were given. On April 28th, 1907, some of the ulcerations had completely healed, some granulating, others, especially those on the head, being absolutely unchanged. The uvula was completely destroyed. He received Zittmann mixture and iodipin; and from April 28th to May 7th hypodermic injections of corrosive sublimate. Beginning May 23d, injection of atoxyl 0.2 per dose. After three of these injections had been given, this form of treatment was interrupted and two courses of inunction were given. He was discharged on June 7th, refusing to submit to any further treatment. At that time the pharyngeal sores were healed, leaving immense scars; all the skin syphilides had disappeared with the exception of efflorescences of the size of a quarter on the buttocks. But already on June 12th he had to return to the hospital on account of the reappearance of ulcerations on the skin. He received ten hypodermic injections of atoxyl and six of calomel. In November he received thirty-two inunctions of potassium iodide and saiodin. In April, 1908, an ulcer appeared on the penis, gradually increasing in size. On May 20th, 1908, he was readmitted to the Virchow Hospital. His treatment consisted of injections of arsenic and calomel, administration of casein iodide, potassium iodide, and inunctions. Discharged on August 31st, 1908, improved. During November and December, 1908, he once more received calomel; from February to June, 1909, mercurial inunctions; from October to December, 1909, inunctions and calomel; from January to March, 1910, inunction and potassium iodide. On April 2d, 1910, he was readmitted to my department. At that time the patient was in a miserable condition; he had a sore about the size of a hand, on the inside of his thigh, of a bluish-red color, partially closed by scar tissue. There was a similar ulceration on his skull, measuring 2 by 6 cm., of a seripiginous character, colored with grayish necrotic tissue. Some of the bones were distinctly thickened. Another ulceration of the same character covered entirely the glans and the ventral side of the skin of the penis reaching down to the fascia. There were left in this ulcerated surface only a few islands of intact skin, the size of a lentil. Patient states that since the disease started in 1906, the ulceration on the penis has been healed only superficially for a few days at a time. On April 13th, 1910, he received 0.25 of the Ehrlich-Hata preparation "606." His

temperature was 38.1° C., the general condition being satisfactory. Severe pains; hypodermic of morphine. On the 14th, temperature 37.2° and 38.2° C.; morphine. General condition satisfactory. On the 15th, morning temperature 37.5° C., evening 39.3° C.; morphine. On the 16th, temperature 37.5° and 38.5° C. Beginning with the 17th, temperature went down to normal and pain disappeared. Healing process made rapid progress. On April 20th, the ulceration on the skull and on the thigh was almost completely healed, and ulceration of the glans much cleaner and smaller. On May 9th all sores were completely healed over so that patient could not be persuaded to stay any longer in the hospital. On May 20th, the cicatrix on the penis showed a slight erosion, undoubtedly due to neglect on the part of the patient. The cicatrix in part broke down. Furthermore, there had developed a periosteal swelling of the right ulna. Immediately after a second injection of 0.45 of Ehrlich's remedy was given on June 26th, the healing process was completed very rapidly, so that at the present time the patient does not show any sores. His general condition has improved to such an extent that he is able to resume his work.

2. Flora S., twenty-five years old, had acquired her infection July, 1905. Since that time she had submitted to various treatments with inunctions and hypodermic injections. For many years she had lost control of her bowels. In a miserable condition she was admitted to my clinic on May 5th, 1909. She had two deep, ill-smelling ulcerations each about 15 cm. long, consisting of various individual sores extending from the perineum upwards to the nates. Traces of a healing process could be observed in the form of atrophic scars, which were surrounded by serpiginous ulcers extending into the surrounding tissue. The rectum was infiltrated, showed two strictures, just admitting the finger, both covered with ulcerations. Wassermann's reaction distinctly positive. Her weight was 45 kg. She received five injections of calomel and potassium iodide, which had to be discontinued on account of the diarrhea. Beginning on May 12th mercury inunctions. The incontinence was somewhat improved. Weight fallen to 40 kg. Application of x-rays to the sore. On July 3rd patient was discharged on her request, the condition being practically unchanged. Four days later she was readmitted. Calomel injection and local treatment were resumed, since mercury was borne badly. On May 4th, 1910, patient received 0.3 of "606." Within a very few days the larger ulcers became cleaner and began to heal. On the 18th they were practically healed with the exception of a few very small spots on the right side. A retroscopic examination showed condition greatly improved, with only a few shallow erosions left over the stricture. General condition much better. Weight remained 48 kg. A second injection of 0.45 was followed by complete healing of all sores. It seems obvious that in both these cases the dose of the first injection was too small.

Arthur P., twenty-three years old, infected seven months ago. Eruption appeared four weeks later. From November 28th, 1909, until the middle of March, 1910, the patient received thirty-five hypodermic injections of mercury salts and calomel. Considerable pain in both knee-joints for the last three months. Patient was admitted to my clinic on May 5th, 1910, in an extremely debilitated condition. He was highly emaciated, his face closely resembling a skull covered with skin of a deadly pallor. All over his face and his body there were very deep ulcers of the size of a nickle and even larger, covered with thick crusts. Some of them were partly closed by scar tissue. An extremely putrid smell came from his nose, in which the septum was perforated; the lower left concha and the vomer were in process of necrosis. There were extensive ulcerations in the naso-pharynx which also extended to the left half of the uvula. Pain made swallowing practically impossible, so that patient had to be fed by means of the stomach-tube and with nutritive enemas. Pulse very small, of poor tension, 120 and above. At first we did not dare to use "606," but when under injection of iodipin his condition gradually grew worse and the disastrous end seemed imminent, we injected on May 21st, 0.4 of "606." No elevation of temperature, pain slight. Already within the next two or three days his condition improved. Five days later healing process marked. On the 30th uvula was healed. All ulcerations completely healed. The diseased bones of the nose were completely cast off and all fetid odor disappeared. On June 7th, patient greatly improved, began to swallow his food and was able to walk around. His weight on May 21st was 41.5 kg., on the 5th of June, 42.5 kg., and on the 7th, 57 kg. At present patient is completely cured.

In a similar way all the usual symptoms of syphilis disappear very rapidly and the healing process seems complete. Especially do primary sores clean up within twelve to twenty-four hours. Erosive chancres heal within a few days, while the very hard infiltrations take from two to three weeks for complete resorption. All glandular swellings, especially maxillary buboes in primary sores of the lips, diminish in size very rapidly, disappear completely, or persist as small hard indurations. Roseola and plaques in the mouths disappear in one or two days, the latter even if smoking is continued. Ulcerated condylomata also rapidly cover with an epithelium. Granulations are reabsorbed. Refractory micro-papular lichenoid syphilides heal very well; also the crust-forming and ulcerous syphilides; while the hard papular infiltrations are sometimes resistant but are quickly transformed into flat, pigmented spots in about a fortnight. Peculiarly enough, in some instances, a leukoderma has been seen to disappear in approximately eight days. The whitish spots turn brown and it must be assumed that an important rôle in this process is played by the well-known tendency of arsenic to foster the development of pigment. Pharyngeal alterations, including rapid de-

structive processes in "syphilis hereditaria tarda" heal within a very short time. The intense pain in the bones, even if it has existed for many years, and the necrotic processes in the bones revealed by x-ray pictures, vanish as if by a magic. Specific orchitis, excrescences of the larynx which almost asphyxiate the patient, swellings of the liver, epileptic attacks caused by a cerebral lues, are cured in a short time. No results were obtained in peri-syphilitic diseases, like progressive paralysis; however, in the first stages of this disease a trial should be made with this new remedy, especially in view of the more favorable experiences of Alt. In cases of *tabes* occasionally an improvement of some of the symptoms does occur. For instance the girdle pain, the dull headache persisting for years, the very severe intercostal neuralgias, and in one case an old weakness of the pharyngeal musculature have promptly disappeared. In another case, though hardly explainable, sexual potency was so well restored that the patient practised intercourse daily. In one case, a few days after one injection, prompt relief was observed from a weakness of the sphincter vesicæ, which had persisted for eight years, and had caused daily enuresis and immediate micturition when the desire appeared. I am as yet unable to decide whether in these cases we are dealing with truly objective and lasting results, or whether the effect is due to the suggestive power, or, probably, to the distinctly stimulating and roborant effects of the remedy already referred to above.

Some of the cases have not shown the signs of a cure until a second injection was given. At first some fear was entertained lest a second injection would render the patient hypersensitive or would prove inefficacious, as the spirochætæ might have become immune against the remedy. Both these apprehensions proved unfounded. I have repeated the injection in the same patient in anywhere from three to four weeks with good results, and even in patients who for unknown reasons have proved completely refractory to a first injection. Second injections also have been given in those very few instances in which there was a recurrence of symptoms. These, however, were never extensive and were usually limited to a few plaques on the tonsils, a slight paralysis of the superior oblique muscle of the eye, etc. After a second injection they promptly subsided.

I should like to speak here on the question of recidivation in syphilis, which, in my opinion is different in certain respects from the relapses observed in trypanosomatous diseases. In this latter group of infections we see complete and permanent cure as a result of "sterilisatio magna," in case the one dose of the remedy was sufficiently large. If the dose was too small, the trypanosomas disappear from the blood, but reappear after a few days. Administration of larger doses of the remedy leads only temporarily to the disappearance of the parasites; finally, they seem not to be influenced at all by the drug, and the death of the host follows. In my opinion the conditions are different in syphilis. The spirochætæ is not a

blood parasite. In the course of the disease the spirochæta probably takes its way through the circulatory system but once, as the negative results of the numerous blood examinations made by myself, in conjunction with Loewenthal and Canon, have shown. There are only very few positive findings recorded in literature. The spirochæta imbeds itself in the tissue, leading to local reaction, but occasionally it will remain for a long time in a definite position without producing any clinical manifestations. Thus spirochætæ still virulent, as has been proved in vaccination (Hoffmann), have been found in the regions of healed syphilitic efflorescences, in the absence of clinical symptoms, by Katzenstein; especially in the tonsils by Guszmán, and in other parts of the body by Pasini. The recurrences are explained by the persistence of such foci of spirochætæ, and for this reason the number of syphilitic manifestations gradually decreases from one attack to the next, until finally only a few solitary gummas appear. Also the corymbose syphilide, consisting of numerous small foci in the immediate neighborhood of the central herd, distinctly proves that the faculty of proliferation of the spirochætæ is locally limited.

The anatomical structure of syphilitic lesions explains why at times some foci of spirochætæ will resist the remedy. The spirochætæ are destroyed and the new tissue, formed as a reactive process, is eliminated and reabsorbed, whenever the injection of the new remedy is followed by the characteristic formation of an infiltration rich in plasma cells, and when it starts a proliferation of the fixed connective-tissue cells surrounding the spirochætæ, as is the case in all soft types of ulceration. A necessary condition is that the vessels remain patulous. If they have been occluded by an endarteritic process, and, especially, if the vas vasorum is obliterated, as can be seen very clearly in cases of syphilides of the veins, then the remedy cannot be carried, by way of the blood, to the spirochætæ which by preference accumulate in the midst of the thrombotic herds. It seems probable that under such conditions the leucocytes gradually destroy the periphery of these formations filled with spirochætæ, and that the leucocytes themselves carry some of the deadly poison to the parasites. A support of such an explanation may be found in the disappearance of the infiltrated papulæ of the skin after two or three weeks, and, especially, in the results of a second injection given approximately four weeks later.

Of extreme interest are some observations of the prompt healing of the primary lesion after the injection of the remedy, but before the appearance of the exanthem; the injection, however, not preventing the development of the typical skin eruptions. In two cases in which the symptoms of the second stage had appeared on the second and eighth day, respectively, after the injection, they disappeared spontaneously under the influence of the remedy still present in the blood. In three other cases, in which three weeks had passed since the injection, the second administration of the remedy became necessary.

Experience with several thousands of cases seems to prove that the remedy does not show any noteworthy toxicity. Unfavorable effects on the heart, on the intestinal tract or kidneys have not been observed, at least not in any dangerous form. Nevertheless, extreme care should be exerted in cases of very pronounced vascular changes or weakness of the heart. Pregnant women stand the remedy very well and no harmful effect is exerted upon the fœti. Glueck has reported only one observation of fetal death. It seems, however, extremely doubtful whether this death should be ascribed to the remedy and not more appropriately to the syphilides. In several instances, patients suffering from nephritis have stood the remedy very well; indeed, in some instances the albumin disappeared from the urine, thus proving the probable syphilitic etiology of the condition. In a case of pernicious anemia, in which the hemoglobin was as low as 20 per cent., the patient being in a febrile condition and dyspnoic, no ill effect was observed from the administration of this drug. Almost all patients showed an immediate improvement in their general condition and increased at times very rapidly in weight. Of course it cannot be excluded that occasionally symptoms of intoxication, probably the result of an existing hypersensitiveness, could be encountered. There was reason to fear harmful effects upon the optic nerve, which, however, up to the present day have never been observed by us. Dr. Fehr carefully examined all our patients before and after the treatment. Whenever changes in the optic nerve were observed, we refrained from using the remedy. Prof. Ehrlich informs me that his experiments on animals indicate that a toxic effect upon the eye is rather improbable. It has been shown that some of the aromatic compounds of arsenic will produce peculiar disturbances of coördination in mice, as illustrated in the so-called "dancing mice." Roetig proved that these dancing mice show degenerations of the vestibular nerve and also often of the optic tract. Such changes do not occur with the new remedy. Clinical observation, indeed, has manifested that even in the presence of an affected optic nerve, "606" is borne well. One of our first patients by mistake escaped an ophthalmoscopic examination. After the injection had been given on April 9th, it was learned that she had been subjected to an inunction treatment from January 1st to February 9th, 1910, and that at that time the symptoms of an optic neuritis (the contour of both optic disks indistinct, venous hyperemia) were present.

Re-examined by Dr. Fehr, the fundus was found free from any pathological changes, the vision being normal. In cases previously treated with atoxyl and arsacetin, the new remedy was given without any harmful effects, although the patients were informed of the possibility of such danger. Of late, I have actually attempted to use the remedy in cases of atrophy of the optic nerve in the hope of arresting the process, and I can state there has never been any aggravation of the condition. An existing hypersensitiveness must be responsible, if in rare

instances, on the eighth or ninth day after injection, the temperature rises considerably, the patient feels extremely weak, an exanthem resembling measles appears, or an angina develops. These pathological symptoms will disappear approximately within forty-eight hours. Even in regions in which spirochætae were found in large numbers, they can no longer be found from twenty-four to forty-eight hours later. If they are present five or six days later they are seen thickened and moving only very lazily.

Whether the new remedy actually effects a complete cure, cannot be said at this time in regard to a disease characterized by the instability of relapses. All the cases under my observation got well at least temporarily, and therefore left a good impression with me. It cannot be stated at this time whether the Wassermann reaction, which as a rule sooner or later disappears after the injection, will remain permanently negative. In this connection, I would refer the reader to investigations made by my assistant, Dr. Lange, published in the *Dermatologische Zeitschrift*, No. 7, 1910, and in the *Berliner klinische Wochenschrift*, No. 36, 1910. I have never felt inclined to make use of the intravenous method of application, as first described by Iversen and given preference by Schreiber, because in my opinion this method is difficult and more liable to produce such disagreeable symptoms as chills and vomiting. Indeed, in one case described by Fraenkel, this method was supposed to have led to a fatal issue. The intravenous method does not seem to have a more pronounced effect.

At first we gave our injection, according to the ideas of Ehrlich, in the gluteal muscles. We added a few drops of methyl-alcohol or glycol to "606," then 10 c.c. of distilled water, thus obtaining a clear acid solution to which we at first added 2 to 3 c.c. of a 1/10 per cent. of a normal potassium solution. If at first 2 c.c. of a 1 per cent. solution of novocain was injected and then the "606" applied through the same needle, very little pain was experienced immediately after the injection. After an hour or several hours, attacks of severe neuralgic pains in the calves or in the region of the sciatic nerve, at times radiating into the pudendal nerve, would make their appearance, necessitating almost without exception several injections of morphine. We have never observed such alarming symptoms as described by Spatz in his first few cases. Within the next few days, as a rule, the temperature would rise to 38° C. occasionally up to 39° C. While the neuralgic pain would gradually subside on the second or third day, a tense, occasionally slightly reddened infiltration would appear on the skin of the gluteal region. This infiltration usually disappeared on the sixth day under application of the ice-bag or the thermophore, the temperature returning to normal. Some sciatic pain, varying from very slight discomfort to moderate suffering, continued for three or four weeks in some cases. Our results were considerably more satisfactory when

we began to reduce systematically the acidity of the solution, finally resorting to neutral emulsions. Only recently Lange found that "606" is soluble in a solution of caustic soda, as found on the market. It was possible in this way to reduce the quantity of the solution to from 4 to 8 c.c., and to eliminate the methyl-alcohol, which, even in minimal quantities, produces in hypersensitive patients an amaurosis, as has been shown by the investigation of Guth.

"606" is dissolved by rubbing it up in a mortar with 1 to 2 c.c. of the commercial solution of caustic soda. Glacial acetic acid is added drop by drop until a fine, yellow slimy sediment appears. The latter is mixed with from 1 to 2 c.c. of sterilized distilled water. To this solution is added either 1/10 per cent. of the standard solution of caustic soda or 1 per cent. of acetic acid until litmus-paper shows the solution to be exactly neutral. Absolute painlessness of the injection is dependent upon exact neutralization. We inject the remedy subcutaneously under the shoulder-blade, after careful disinfection including the application of tincture of iodine. The very latest modification adopted by us in the method of injection consists of the centrifugation of the emulsion, and the dilution of the sediment obtained in this way with a physiological saline solution. In this way we have succeeded in making the injection itself absolutely painless. Later on the patient experiences slight drawing pains which soon disappear. On the second or third day, there are some swelling and reaction at the point of injection. Usually these are but slight, and only occasionally does a hard infiltration form, which, however, never tends to suppurate, since it seems to represent not an infectious but only an aseptic chemical reaction.

PELLAGRA: SOME CLINICAL AND OTHER FEATURES OF THE DISEASE.*

By GEO. A. ZELLER, M. D., of Peoria, Ill.,
Superintendent of the Peoria State Hospital.

In order not to be rashly sat down upon as an alarmist or one who, without taking into consideration how extensively an article of this character may be read or how numerous copied, I will state at the outset that when conservative England takes cognizance of a situation and gives it official recognition through the medium of a scientific commission whose membership includes names that are familiar the world over, one may be excused for being somewhat emphatic in bringing to the attention of his colleagues a condition here at home that has not, in the judgment of the writer, received the attention that its gravity warrants.

The prospectus of the British Pellagra Investigation Commission says:

"Pellagra is one of the most formidable disease-scourges of mankind.

"Wherever its occurrence has been noted for any length of time it has shown a marked tendency to slow extension.

"For Italy a yearly estimate of sixty thousand standing cases is no exaggeration, whilst Roumania, with a population of 5,300,000 is estimated to have from 40,000 to 50,000 cases.

"In the United States of America a few sporadic cases have been observed from time to time, but since 1906 the disease seems to have rapidly increased, and numerous cases have already been reported from no less than twenty-two states."

With these few quotations to fortify my stand, I will proceed to offer a few of my own observations and conclusions concerning the disease.

In the first place it will be noted that Roumania and Illinois have about the same population. While I would not for a moment give out the impression that there are 40,000 cases of pellagra in Illinois, the fact remains that the disease is here in no insignificant amount, and that with our present knowledge of the disease we stand powerless to prevent its spread.

A repetition of what has taken place either in Roumania or Italy is easily possible with us.

The causative agent is present among us and in widely distributive sections of the state, and just as long as the causative factor is present

*The illustrations are from cuts, loaned by Dr. J. A. Egan, Secretary of the State Board of Health of Illinois, which were made from pictures taken by the author in 1909.

and that factor remains unknown, just so long is the public health endangered.

I have no right and no desire to deal in theories of origin. These matters are being investigated from every plausible and implausible standpoint in a hundred laboratories.

That results have not been all that we might have had reason to expect is best told in a remark of Captain Siler, of the Medical Corps of the U. S. Army, who, upon his recent return from a winter spent in the London School of Tropical Medicine and from a personal inspection of the pellagrasori in Italy, said: "The Italians have lost sight of pellagra in their researches and have been studying corn."

This very apt comment may convey a great truth. For a century the world has accepted spoiled corn as the origin of the disease and has blindly pinned its faith to the statements that came out of Italy, without once stopping to consider that this conclusion was based absolutely on empirical observations. The increase of pellagra in Italy coincident with the introduction of corn is no more conclusive than to associate it with the appearance of the tomato or the steam-engine.

It is true that the aspergillus will develop in stale cooked corn but, since it is the weed of the laboratory and grows on about every preparation that is left exposed, no very weighty importance can be attached to that fact.

It is not the purport of this article to discuss the corn theory. The zeists and the anti-zeists are fighting it out in the countries where the disease is most prevalent.

I merely desire to state that our contribution to this phase of the question will be given out later.

On October 1st, 1909, we selected 56 non-pellagrous patients on whom to test the corn diet.

They were placed in a separate cottage having its own dining-room, and a special diet consisting of corn and corn products has been issued to them for nine consecutive months. They receive the regular institution diet but in addition thereto they also have a liberal amount of corn-bread, corn-meal mush, fried mush, hominy, corn-flake breakfast food, corn grits, Karo or corn syrup, corn fritters and common corn-starch.

They are kept under close medical observation and are weighed regularly and every feature of their daily life is noted.

They are kept under absolute control so far as diet and living is concerned, but otherwise have the freedom of their cottage, its porches and the surrounding grounds.

The results have been uniformly negative. The cottage has produced fewer pellagrins than other similar number of patients in the Institution. This is explainable upon the grounds that extra precautions were taken to exclude pellagrins at the time the group was selected for the feeding experiment. Naturally such a body of patients should develop

fewer cases than the adjacent cottage of mixed patients where there was no control.

Accepting the corn theory, however, would lead to the conclusion that they would all develop the disease.

If the experiment has in any way been conclusive, it would simply teach us that the amount of corn consumed is at least not a factor in the causation of pellagra. For this reason the experiment is of little value, as most zeists only claim that spoiled corn is the seat of the disease.

Our corn diet included the best of everything that was to be had in the market; and each purchase was conscientiously inspected, and the identical preparations given to these patients were a part of the daily diet of the employees and officers, except that the percentage of corn products



A well-marked case of pellagrous erythema with partial exfoliation.

was not as excessive nor was there corn present at every meal as in the case of the controls. The results of this experiment will be given out in a special article at a later date.

It is merely mentioned here in order that the profession may know that some thought has been turned in this direction, and that in the face of an overwhelming preponderance of opinion that corn is the cause of pellagra there is still room for experiment. I doubt very much whether an experiment of this magnitude and covering such a period has ever taken place anywhere in the world.

It was conceived by Capt. H. J. Nichols, of the Medical Corps of the U. S. Army, and I have entrusted the carrying out of the details to Dr. Rachel Watkins of my staff.

Perhaps the greatest compliment paid to American scientific ability and zeal is the statement recently made in London, that it is fortunate that pellagra has been discovered in the United States as "these fellows will not cease their efforts until they have worked it out."

In order to stimulate effort in this direction it is necessary that the American physician should first of all be able to recognize this disease when he encounters it; and, secondly, statistics must be collected in order to awaken public opinion to the importance of the situation.

In the collection of these statistics it is not so essential that absolute precision prevail.

Even if an occasional case of eczema or psoriasis or even common scabies is mistaken for pellagra, the efforts of the seeker after the truth are in no way invalidated.

The writer of this article is the superintendent of an insane asylum of 2100 inmates, and if he were asked to define the cause of insanity he would be as sorely perplexed as if asked the same question concerning pellagra.

Yet insanity exists to the extent of several hundred thousand victims in the United States, and the cost of the care of the insane constitutes by far the largest item of public expenditure in every state in the Union.

Psychiatrists and neurologists are studying it the world over, and millions upon millions have been spent in the construction of asylums and hospitals; yet, aside from an insignificant group, the cause of insanity remains as much a mystery as it was a thousand years ago.

Symptoms have been studied and grouped and many ingenious classifications have been made, but the real cause of insanity has not yet been revealed.

Why then postpone our study of pellagra until the cause is known? The fact that it is present and recognizable and fatal ought to be sufficient to stimulate the activity of the most conservative disbeliever.

It is a cruel disease, and its painlessness and the fact that every visible symptom may absolutely disappear for a considerable portion of the year only adds to its insidiousness.

A woman recently died of pellagra in Peoria, her case having been passed upon and diagnosed by some of the ablest experts in the state. The skin lesions were most pronounced and the synonym for pellagra—Italian Leprosy—seemed as apt a description as any.

The mouth symptoms were equally prominent and the other synonym, Alpine Scurvy, was equally applicable. Her features were pinched and drawn; the eyes were staring and her mental faculties were at times so disturbed as to well merit the appellation, pellagrous insanity. Yet this woman showed a continuous and clear history of this condition for seven years, and not until March of this year was it recognized as pellagra.

During these seven years no less than half a dozen physicians treated her for about everything except pellagra.

The recognition of pellagra in the adjacent state institution last summer aroused widespread interest in the disease, and many physicians availed themselves of the opportunity of studying it at the bedside. Into the hands of one of these the patient fell this year, with the result that the obscurity of the previous seven years was removed. Certainly no criticism could attach to those members of the profession who attended her during



The "pellagrous glove," a pathognomonic symptom found in no other disease.

the previous years, but this experience simply brings up the thought that there may be other cases passing through the same slow and progressive stages that eventually lead to death.

The duration is not infrequently fifteen years and the belief that it is limited to field laborers, or exclusively to any condition in life, is rapidly giving way, especially in the Southern States where almost every condition of society has yielded its victims. Like all wasting diseases, however, it naturally makes the greatest inroads upon those who are poorly nourished.

It is a disease predisposed to attack those past middle life, yet some of the most virulent cases have developed in children of eight and ten years of age.

It is a disease that is affected by solar influences and the pigmentation of the hands is almost pathognomonic; yet the negro of the South with a skin blacker than that of the most pronounced white pellagrin falls an easy victim to it.

It is associated with amebic dysentery, yet some of the most typical cases pass on to death without a single intestinal manifestation, subsequent autopsies having shown an undamaged intestinal canal.

It is a disease to which the ill-nourished seem predisposed, yet I have seen it occur in a most virulent form in people of splendid physique.

It is a disease whose ultimate duration is fifteen or twenty years, though we see cases, which developing initially, run their course and terminate fatally in a week, and exhibit within that short time every symptom that has ever been described.

It is a disease that is unquestionably spreading; nevertheless there is not the slightest evidence that it is contagious or communicable. Personal contact with two hundred cases for many months has never caused a nurse in this institution to feel the slightest alarm. Writers on pellagra differ widely in their views regarding the disease, but all are united in declaring it non-contagious.

In general the detection of the pellagra is exceedingly simple. Its landmarks are as pronounced as leprosy itself, and a diagnosis is as simple as in scarlatina or smallpox.

It has anomalies and vagaries in its manifestations as erratic as those already mentioned, but these are the atypical features that are occasionally encountered in nearly all well-known and clearly-defined diseases.

To begin with, Lombroso says that no diagnostic eye can differentiate between a sunburn and a pellagrous lesion on the hand or neck.

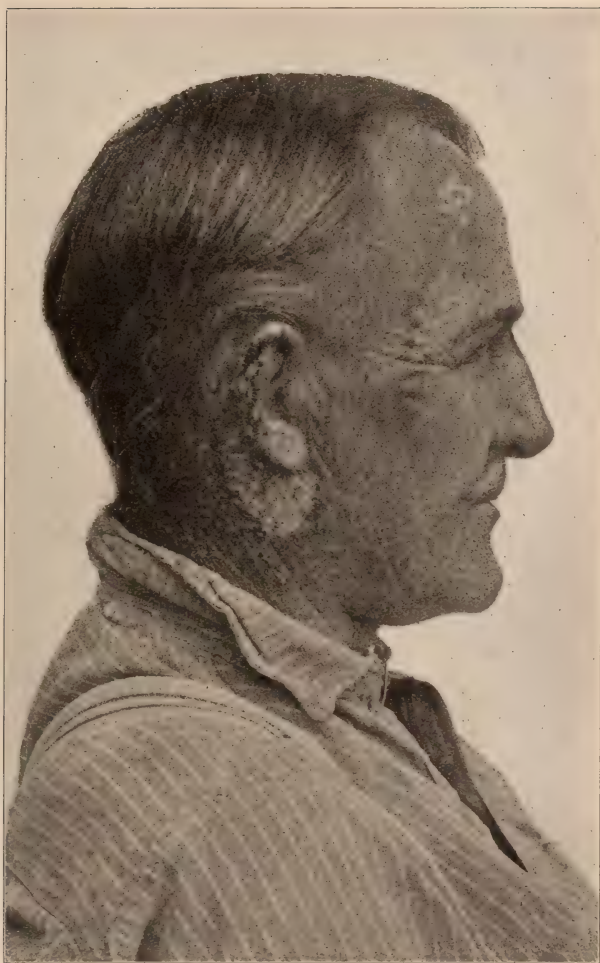
I know this not only to be true, but am painfully aware that the similarity prevented me from recognizing pellagra for several years, at least.

The erythema of the dorsum of the hands is the most uniformly present symptom of the disease. Beginning above the knuckles it extends upward to what is erroneously supposed to be the cuff line, where a remarkably clear line of demarcation is shown. As a matter of fact this line and the cuff line have nothing in common. In studying a large number of cases and noting the exact lower margin of the sleeve, it will be universally observed that the redness of the forearm extends at least four inches above this point, and that the shading of the sleeve does not prevent the disease from covering its metamere.

At times the knuckles themselves show the primary lesion; the redness extends to the mid-phalangeal articulations, and in very pronounced cases a formidable dermatitis extends to the lunula of the nails.

At first a luminous red, the color soon changes to a polished bronze.

If bullæ form at this stage the metamorphosis assumes the exact form of a cantharides blister; from which it would be extremely difficult to differentiate it.



Well-marked lesions known as "The Butterfly."

The epidermis is quickly elevated as the exudate increases and a bleb of classic formation ensues.

After a day or two the epidermis parts by abrasion or otherwise; and as it desquamates, the new skin, almost of the color of the ripe beet, shows numerous minute granulations. Ulceration is exceedingly rare and usually heals quickly.

Throughout those changes there is no pain. An intelligent patient will complain of a very slight burning sensation at first, just as he will speak of an occasional itching sensation in the eczematous stage.

In an ordinary case desquamation will be complete in five or six weeks, but a few scales will be observed at the juncture of the disease and healthy skin of the forearm for a much longer period.

The denuded area takes on a mottled complexion, and, as in the height of the disease, the blood is tardy in returning to the capillaries after pressure.

Occasionally a hyperkeratosis sets in until a formidable black crust envelops the knees and elbows. It continues to reform as rapidly as it exfoliates or is removed, and is usually of a black or dirty gray color.

Rarely does the dermatitis involve the palmar aspect of the wrist or hand, yet I have seen cases where the entire palm was shed as completely as in some of the malignant forms of scarlatina.

Occasionally, too, the erythema girdles the entire wrist, forming the bracelet that is shown in some of the earliest illustrated treatises on the disease.

The most uniform characteristic of the erythema is its symmetry. Always bilateral, its markings on either arm are identical. If the discoloration extends to the terminal phalanges of one hand it will show the identical tracings on the other, and if the dorsum of one finger shows a more pronounced lesion than the others, the corresponding finger of the other hand will exhibit almost the identical condition.

Even where the eruption jumps the line and makes for the elbow on one arm the same phenomenon will be found on the other.

I am fortunately able to exhibit photographs strikingly illustrative of this diagnostic point.

The lesions of the face and neck are equally symmetrical, although exhibited much less frequently.

Sometimes they consist of a blister completely engirdling the neck with three or four pyramidal patches extending well up to the margin of the hair. A similar band is occasionally thrown across the forehead, and in pronounced cases both upper eyelids become deeply reddened and the epidermis exfoliates.

Over both malar bones a fiery redness is shown constituting the well-known butterfly. Both temples are a not infrequent site of pronounced blebs, and similar lesions occur over each mastoid.

The lesions on the feet are even more striking, although extremely rare. In a single night reddening will take place, and within twenty-four hours



A rarer instance, where the erythema encircles the wrist, constituting the "pellagrous bracelet."

numerous bullæ will form. The line of demarcation is sharply drawn at about the juncture of the lower and middle thirds of the tibia, corresponding to the usual stocking line.

Perfectly rounded blebs form on the dorsum of the feet, and the subsequent desquamation usually extends to the margin of the plantar tissue.

In several cases, however, the entire plantar surface became denuded. I recall one particular instance where the soles of the feet were shed almost intact very much resembling a moccasin.

The suddenness with which the symptoms of the feet manifest themselves makes it extremely difficult to differentiate from scalds. My own experience includes two such instances in both of which the coroner was called and a verdict of accidental death from scalding returned.

This was during our supposedly pre-pellagrous days but the error could not again occur.

Any explanation other than scalds would have been received with derision at that time, but now even a conservative coroner would accept pellagra as the true cause of such lesions with the slightest showing of corroborative testimony.

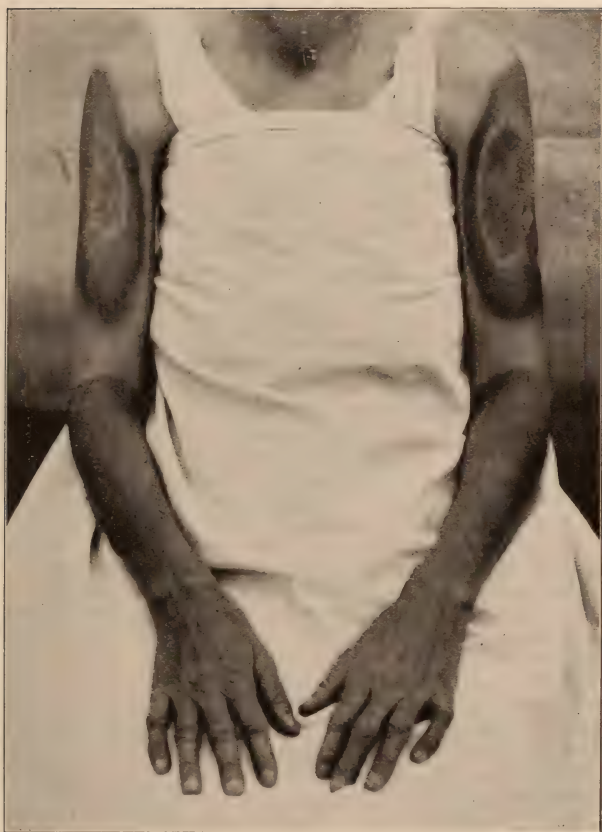
The occurrence of pellagrous lesions of the feet is also strikingly at variance with the theory of solar influences, as I have known pellagrins, who had spent the entire winter in bed convalescing from the disease, suddenly develop lesions of the feet of the most pronounced character. Not only had their lower extremities been free from exposure to sunlight, but the lesions developed in midwinter after the patient had been for months under blankets.

A still more pronounced, though somewhat rare exhibition, is the involvement of the perineum in the female.

Almost without warning, the labiæ and the parts within the perineal folds will turn black, rapid slough ensuing and death speedily taking place. This region seems to be immune in men, although in the male as well as the female the axillary region is occasionally the seat of pellagrous action.

A peculiar dagger-like discoloration running down from the neck over the manubrium has sometimes been described as due to the open collar of the workingman's shirt, but it has been noticed in unbroken symmetry in patients who wore sweaters or whose gowns buttoned behind. It is simply another of the characteristic pictures of a disease that presents many peculiarities, but preserves a marked symmetry throughout all of them.

Face and neck lesions usually do not recur, but the lesions on the hands, ankles and knees continue to manifest themselves from year to year. The skin, at first hypertrophied, naturally becomes so atrophied as to be highly translucent. In many cases it resembles parchment. Resolution becomes apparently complete after the first and second attack, and through the winter months the discoloration wholly disappears.



An unusual manifestation in which the erythema, after forming a line of demarkation at elbows, reappeared on the arms higher up with a clear area intervening.

Immediately upon the return of warm weather the pigmentation becomes more pronounced, and by November we can readily recognize the ambulatory pellagrin of two or three years standing by the discolored hands.

Many times this is ascribed to senile or atrophic changes, but to the trained eye the pellagrous glove is a tell-tale of no uncertain meaning, even while the victim is wholly unconscious of the slightest ailment.

The gastro-intestinal symptoms are as striking as those of the skin, except that the internal symptoms simulate numerous other diseases, while the external marks are peculiar to pellagra alone and resemble sunburns only, which can easily be excluded.

In fatal cases the mouth presents all the symptoms of severe scorbutus. I recall having seen many cases of sprue in the tropics, which I would call pellagra if encountered here. Aphthous patches abound along the buccal mucous membranes, the tip and sides of the tongue become fiery red, the gums become spongy and bleed on touch.

A line of demarcation runs from either angle of the mouth along the lower lip, with the external half dry and stained somewhat of a walnut color, while the inner surface of the lip again shows the lustrous red seen at the height of the erythema on the hands.

A persistent diarrhea sets in and the stools have all the characteristics of dysentery, except that bloody passages are less frequent. At this stage amebæ are usually present in the stools and flagella abound.

Post-mortem examination usually reveals a colon that is studded with ulcers of varying sizes and depth. The spleen, kidneys, liver and pancreas are usually undersized and are purple, almost blue in color.

The end comes to such a patient quite painlessly. He does not fall into a coma, but a listlessness and an unconcern comes over him and he seldom complains.

The stools are exceedingly offensive, and often when a physician frequents the wards of a pellagrasorium the thought occurs to him that he can detect the disease by means of the olfactory nerves.

The face rapidly ages as in Asiatic cholera. Deep lines form in the cheeks and the hollow-eyed expression is noticeable. The voice does not become husky as in cholera but the secretion of urine is lessened. The passages become involuntary and the patient gradually becomes weaker, and, without going to sleep, he passes away so imperceptibly that the nurse is left in doubt for some time as to whether or not the end has come.

In the sane a profound melancholia accompanies the disease.

I recently saw a rural route mail-carrier who lost eighty pounds in three months, and the depression in his case was so great as to excite the fears of his family. It might be presumed that a sane person having a well-marked case of a disease, which up to the present time offers so little hope of cure, would naturally feel depressed and lose flesh. In this

instance, however, the man did not know that he had pellagra; in fact, he had never heard of the disease, nor did those who had first attended him have the slightest idea of the character of his illness. Hence, it can be safely assumed that all these symptoms were the direct result of the disease itself. In Italy it has been noted that the disease develops the suicidal mania.

In the insane we find that a distinct delirium ensues, and demented who for years have refused to speak suddenly become quite voluble. To one actively associated with the insane, who at the same time sees several hundred pellagrins around him daily, and recognizes alike the obscurity that surrounds mental disorders as well as pellagra, the thought is constantly uppermost that when the cause of the one is discovered light will be shed upon the other.

A typical case of pellagra in running its course will present, aside from its visible changes, almost every mental and nerve symptom exhibited in a typical case of paresis, the terminal stages of the two being strikingly alike.

It is barely possible that the toxin of pellagra is a poison so subtle that it manifests itself in the delicate centres of the brain, months and perhaps years before external evidences are manifest.

Pellagra terminates in insanity. Does insanity terminate in pellagra, precede it or is insanity indeed pellagra?

Pellagrous insanity has reached the dignity of official recognition in Italy and in the Southern States, and patients are regularly committed to the asylums under that classification.

How soon will we accept the term and how extensively will we employ it?

These are a few of the preliminary thoughts that I desire to put forward in this manner, reserving for another occasion the presentation of other phases of the disease.

FURTHER REMARKS ON DUODENAL ALIMENTATION.

By MAX EINHORN, M. D., of New York,
Professor of Internal Medicine at the New York Postgraduate Medical School.

A short while ago I published a paper* on duodenal alimentation. The method consists in inserting the duodenal pump into the digestive tract. When the latter has reached the duodenum, nourishment is injected into this part of the gut. The instrument is then left *in situ* from ten to fourteen days and nourishment given through it. It was shown that this is a feasible means of feeding and that it is possible to nourish the organism by this means without much loss of flesh.

I have since had the opportunity of employing this method of alimentation in 3 new cases. As the subject is quite new, I deem it of interest to give a full report of these cases.

The injection of the food was facilitated by the use of a specially constructed support for the duodenal feeding apparatus, as illustrated in the following figure. Formerly two persons were required to handle conveniently the apparatus in injecting the food. With the new arrangement one nurse, or if need be, the patient alone can manipulate the instrument.

In 2 of the new cases, it has been found more expedient to administer the nourishment every hour, five ounces of the feeding mixture being given at a time.

Case 1. April 11th, 1910.—Gastric Ulcer. Miss Agnes S., twenty years old, complains for the last three weeks of pains in her abdomen and left side of the chest, accompanied by headache, fever, anorexia, nausea, and vomiting, which latter was of a bloody nature on several occasions. Bowels are regular. The physical examination showed a tender spot, painful to pressure below the ensiform process.

On April 12th the duodenal bucket was given at 9 p. m. and removed on the following morning at 8 a. m. The length of the thread was 85 c.m.; it was slightly yellow at 60 and strongly so from 64 to 85; there was a brownish discoloration between 39 and 41 cm. The contents of the bucket were golden yellow and had an alkaline reaction. The thread test showed the presence of an ulcer at the cardia.

On April 14th, at 9 p. m., the duodenal pump was introduced and on April 15th the duodenal feeding was instituted.

*M. Einhorn: On Duodenal Alimentation. *Medical Record*, July 16, 1910.

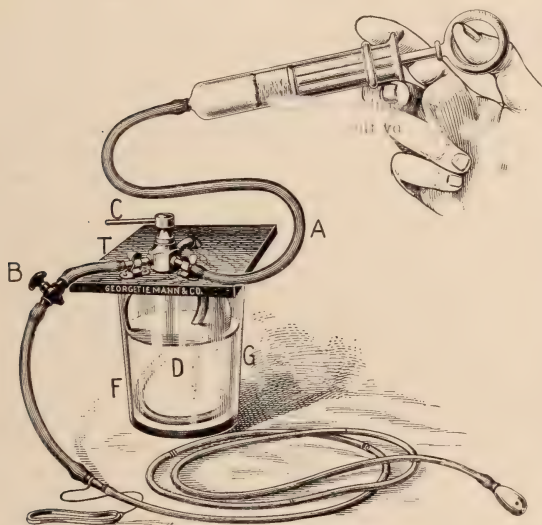
Beginning at 6 a. m., the following nutritive mixture was injected into the duodenum every two hours until 8 p. m.:

One egg.
Lactose ℥ss ℥i
Milk ad ℥viii

In this way eight feedings were given in each twenty-four hours. Besides the patient was given one pint of saline per rectum by Murphy's drop method. The medication was as follows:

Calcined Magnesia gr viiss
Bismuth subnitrate gr. xxx

One powder, three times a day, in a wineglassful of water.



DESCRIPTION OF FIGURE.

The Duodenal Feeding Apparatus, with Table Support. A, tube leading to syringe; B, tube leading to duodenal pump; C, crank; D, tube leading to fluid; F, fluid; G, glass; T, table support or shorter support. When crank C is turned parallel to A, fluid can be aspirated from the glass into the syringe. When C is moved parallel to B, the fluid from the syringe can be emptied into the duodenum.

When beginning treatment, patient's weight was $116\frac{1}{2}$ pounds. On April 23d, *i. e.*, eight days later, it was $116\frac{1}{4}$ pounds. After a period of two weeks the duodenal pump was removed. On that day her weight was 114

pounds. During the entire period of duodenal alimentation patient had lost $2\frac{1}{2}$ pounds. She had no pains, nor nausea, during treatment. When oral alimentation was resumed, there was no return of the gastric symptoms. On April 29th the duodenal bucket was again given at night and removed the following morning. The length of the thread amounted to 91 cm. There was no brownish discoloration; thread golden-yellow from 45 cm. to the bucket. Contents of bucket golden-yellow and of an alkaline reaction. It appears that the ulcer in this case has completely healed.

Case 2. June 6th, 1910.—Gastric ulcer, pylorospasm, and chronic colitis. Eugene F., thirty-one years old, engineer, has always been well except for constipation, from which he has suffered since childhood.

About eight years ago he had an attack of ptomaine poisoning, accompanied by vomiting, lasting from three to four days. Then he did not vomit for a few years, but was severely constipated. About four years ago, without apparent cause, he was suddenly attacked with a severe spell of vomiting after eating in a restaurant. After this sickness he was obliged to suspend business and to rest altogether for about six months, because otherwise, as soon as he would get up and walk, he would have to vomit. He then lost considerable weight. He found that he could not stand any alcohol. He never had syphilis and smoked moderately. After a while the vomiting ceased. Then sour articles, like liquors, vinegar, pickles, olives, salads, would always distress him. He then had a pain in the epigastrium and over the region of the colon and had a considerable amount of gas. Patient frequently complained of headaches and his digestion was always disturbed. His bowels were never in order. Slight pains accompanied by flatus were almost always present, and obstinate constipation often alternated with diarrhea.

The examination showed tenderness on pressure in the epigastric region and also over the entire colon. The stomach was dilated, extending two fingers' width below the navel. It also showed the presence of intense hyperchlorhydria and slight isochymia. One hour after a test breakfast, the examination revealed $\text{HCl} + \text{Ac} = 110$ presence of food from the previous night. The duodenal bucket was introduced on the evening of May 31st and removed on June 1st in the fasting condition of the patient. The length of the thread was 70 cm., revealing a yellowish golden color from 60 to 70, and a brownish discoloration between 53 to 54 cm. The contents of the bucket showed a yellow color from admixture of the bile and a strongly acid reaction with $\text{HCl} +$.

The diagnosis of gastric ulcer, with pylorospasm leading to isochymia, also colitis of a severe degree, was made.

On June 13th, 1910, patient entered the German Hospital. The duodenal pump was introduced. On the 13th, liquid food was given by mouth every two hours.

On June 14th, the pump was found to be lodged in the duodenum; duodenal alimentation was at once instituted, the same regime being followed as described in Case No. 1. On account of the great intestinal irritability, due to the presence of his old and obstinate colitis, several changes in the medication, as well as in the mode of alimentation, had to be made. First the calcined magnesia was omitted, later the lactose was discontinued, and lime-water added. Ultimately the nourishment was given every hour in five-ounce portions. This seemed to agree best with the patient. With regard to the sensations experienced during the period of duodenal alimentation, I give the patient's description verbatim.

Sensations not experienced.—"I had absolutely no appetite nor hunger. I sometimes inhaled odors of cooking food. Although these smelled good, I had no great desire nor craving for food. My tongue was continually coated and I had a bitter taste in the mouth. This took away all desire for smoking. With the exception of the local sensations described below, I had no other abnormal sensations, such as general physical weakness, headache, dizziness, etc."

Sensations experienced.—"The sensations experienced were in two distinct parts of the body, (a) in the stomach, (b) in the intestines. The sensations in the stomach were continuous and intense only for three days and intermittent and infrequent thereafter. Some of the sensations in the intestines were pronounced practically all the time."

(a) *Sensations in the stomach.*—"The sensations in the stomach were of one kind, an intense burning pain, located at one single spot behind and possibly slightly below the lower end of the breast-bone and shooting therefrom upward to the back of the throat just behind the 'Adams' Apple.' This shooting pain occurred whenever I swallowed, which I did almost continuously throughout the first period of my pain, as at this time saliva formed rapidly in my mouth. The pain would attack my stomach fully two or three seconds after I had swallowed. The pain commenced about the second day after the tube had passed the pylorus, and continued for about three days, after which it lasted for only about half a minute at a time, except on the 14th, or last day the tube remained in. On this day it occurred at the 5 p. m. o'clock feeding, became intense at the 6 o'clock feeding and lasted into the night."

(b) *Sensations in the intestines.*—"The sensations in my intestines were of three kinds; distension of the duodenum after feeding, gas and pain. I did not at all feel the food pass into my intestines, excepting with my lips, as the food was forced through the tube. After I had taken about four ounces of food, my intestines started to feel distended. At the same time it felt as if gas were percolating through my bowels towards the rectum, very much as if the gas were forced by the food injected. After about five ounces had been injected, the distention turned into a decided pain located in the ascending colon, accompanied by a soreness

in the descending colon. The intense pain would last about an hour after feeding, but the large intestine was not free from soreness at any time during this period. After the change in the feeding and the medicine, the pain in the bowels disappeared, although they are still sore to the touch. The sensation of distention after feeding, and the passing of gas continued. This latter was excessive and I frequently had to belch it through my mouth, when the pain in my stomach, as described above, recurred. The pain in my bowels recurred but very slightly, when the sugar in the food was increased to the original amount."

The duodenal pump was removed on June 28th.

Notwithstanding the severity of the case and the complication of colitis, the patient has not lost much in weight during the period of duodenal alimentation. His weight on the 16th of June was 146 pounds and on the 26th, 144.

The general condition of the patient improved materially. The thread test with the duodenal bucket, however, showed that the ulcer had not, as yet, healed.

Case 3. June 19th, 1910.—Ulcer of the stomach; pylorospasm, with temporary isochymia. Wm. L. B., 36 years old, began to suffer in 1891 from pains in the pit of his stomach, particularly two or three hours after eating. This first spell lasted several months and was attributed by patient to several glasses of ice cold lemonade he drank when overheated.

In 1895-96 patient experienced another severe spell, extending over a period of many months, during which time patient wasted away to a shadow. The symptoms were similar to the first attack, though this one ended with a steady ache in the pit of the stomach. In July, 1896, patient went to Denver, Colo., and there regained health and weight. For the next three to four years, patient spent much of the time traveling by train for business purposes. During this period he had many spells with his stomach, lasting from a few days to a few weeks.

Patient was treated by several physicians with only temporary relief. In 1903 patient's condition became so serious that he was brought to New York. Dr. Eugene Fuller had the kindness to refer the patient to me. Patient's condition at that time was as follows: His weight was 118 pounds. He was suffering almost constantly. His gastric contents showed a high degree of hyperchlorhydria and slight isochymia. Patient was then treated with gastric lavage, the regular ulcer-cure of Leube-Ziemssen and later on, with spraying of the stomach with a 2 per mille solution of nitrate of silver. He then gradually recovered and increased in weight to 150 pounds, and later on, after reaching home, in Utah, to 165 pounds. Until 1906 patient was free from stomach trouble, eating in general what he wanted of good, plain, wholesome food. Then spells of distress began to appear—now for a day or two, then a week, with intervals between of weeks, sometimes months, but gradually becoming

more frequent, until December, 1909, when a steady ache again developed in the pit of his stomach. Patient's weight decreased by March, 1910, to 145 pounds. His color became "muddy" and he could take no food without more or less distress.

Patient went to Southern California, where after a few weeks he began to feel better. His weight and color, however, did not improve. Returning to Utah, patient's condition again became serious and he therefore came to New York for aid.

A thorough examination revealed a similar condition to that found in 1903—namely, pronounced hyperchlorhydria, slight isochymia, and tenderness on pressure over the gastric region. On palpation there could be detected a slight resistant mass, of oval shape and thumb's size, in the pyloric region.

An examination with the duodenal bucket on June 20th, showed that the bucket did not pass the pylorus (although it had lodged in the digestive tract about ten hours) and the thread revealed a brownish discoloration between 44 and 46 cm.

On June 21st, gastric lavage in the fasting condition was applied and a small quantity of chyme detected as being present. Patient was put on a strictly liquid diet and given calcined magnesia and subnitrate of bismuth.

On June 22, gastric lavage in the fasting condition showed absence of food. On June 22, at 9 p. m., the duodenal bucket was again inserted and removed on June 23d at 8 a. m. This time the bucket had passed the pylorus, the lower part of the thread showing a distinctly greenish-yellow discoloration; there was again a brownish stain between 45 and 47 cm.

Basing the diagnosis on the facts obtained, it appeared plausible that we had to deal with an ulcer of the stomach situated at the lesser curvature causing pylorospasm and temporary isochymia. The resistant mass was referred to the spasmodically contracted pylorus.

In order to give the stomach a perfect rest, duodenal alimentation was decided upon. The duodenal pump was introduced on June 23d about 8:30 a. m. and about 12 noon the instrument had reached the duodenum. Notwithstanding patient's having a sore throat, the feeding by the duodenum was now instituted. With the exception of the first two to three days, during which the pharyngitis accompanied by fever greatly annoyed the patient, his condition during the period of duodenal alimentation was satisfactory. Nourishment was given every hour, the amount being five ounces (milk \mathfrak{z} iv., half a raw egg, lactose \mathfrak{z} ss.): Sixteen feedings in twenty-four hours. Besides, one quart of saline was given per rectum by Murphy's drop method; some water by mouth and also the magnesia and bismuth medication. Patient gargled his throat with a chlorate of potash solution and washed his mouth either with tincture of myrrh, or Glyco-Thymolin (both greatly diluted with water).

July 7th the duodenal pump was withdrawn and oral alimentation resumed. Patient's weight was on June 25th, at 6 a. m. (fasting condition) 131¾ pounds, and July 7th at 6 a. m. (fasting condition), 132 pounds.

In this way during twelve days of duodenal alimentation there was no loss of weight, rather a gain of a quarter of a pound. The resistance in the pyloric region had meanwhile disappeared, and patient's general condition appeared much better, although the thread test with the duodenal bucket on July 9th showed an intense reaction on the thread (brownish-red discoloration) between 45 and 57 cm.

Patient continued to improve and gain in weight up to the present.

In the above 3 cases of gastric ulcers (2 associated with pylorospasm) have been reported, which had improved under duodenal alimentation. In one the thread test after treatment gave a negative result, while in the 2 remaining it was still positive. Among the 3 previous cases of duodenal alimentation, published in the *Medical Record* (July 16th, 1910), there were two patients with gastric ulcer. In one the thread test after treatment proved negative, while in the other the test was not made. Inasmuch as the site of the ulcer (in cases giving a positive thread reaction) is known, and inasmuch as in these, during the period of duodenal alimentation, the rubber tube of the pump is always in more or less intimate contact with the affected area, it appears plausible to surround that part of the tubing with healing substances. In this way an effective local treatment might be achieved and thus the value of duodenal feeding,—giving perfect rest to the stomach,—greatly increased. In future cases I shall attempt to carry out this plan and describe it later, should it prove practical.

FUNCTIONAL DISORDERS OF THE GENITO-URINARY SYSTEM.

By E. O. SMITH, M. D., of Cincinnati,
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This class of cases has not been given the consideration it deserves, neither by the general practitioner nor by the specialist. They have too often been looked upon lightly and indifferently, and after having gone from one physician to another, receiving the same indifferent treatment from all, they go from our care to the ever-present charlatan, where they are not only not made better, but are in a worse state than before. If the real condition of these patients was recognized and properly taken care of by the first physician consulted, satisfactory results would more often be obtained. These patients are real sufferers and need a very definite and positive treatment. We do not fully appreciate the fact that they are often in more serious need of our special care than are many who have organic troubles. They are too frequently told that they are "nervous," are quickly dismissed with instructions to take a cold bath each morning or evening, and are given a prescription for some bromides. The physician is rather glad the patient has gone and secretly hopes that he will not return. However, he is not surprised to have his patient return the next week and report "no better." He feels that the trouble is only imaginary and that it is either of not much importance or that there is not much to be done that is curative, so he orders more baths and larger doses of the bromides, or possibly uses the battery or passes a sound. He may tell the patient there is nothing the matter with him and thus literally drive him to the quack.

The disturbance in these patients is of psychical origin, and it is the influence of the mind and of mental impressions and representations, which not only causes the disorder, but keeps it ever before them as irremediable. It must be determined beyond all doubt that there is no organic disease present. This is done by a most careful and thorough examination of the entire body. Having satisfied yourself that the trouble is of psychical origin, it must receive psychical treatment. The patient must be made master of himself by educating his reason. He must be assured that his trouble is functional and not organic, and that treatment must be directed to the source of his trouble and not to what he considers local and organic. The physician must get the full confidence of his patient; he should talk to him as a friend and comrade. Then he can be made to understand that his affliction is purely psychical. When this is ac-

completed, the patient is well on the road to recovery. When there is no organic trouble, not only is time wasted, but positive harm is done by recommending perineal douches, by the use of electricity, by the passing of cold sounds or the deep urethral instillation of nitrate of silver. By this plan of treatment the patient is encouraged in his false ideas of organic disease and will think that his diagnosis is correct, as the physician is treating him for a local condition. In fact, the physician is not honest with his patient, for he knows full well that the local conditions are normal and that they do not need treatment. This local treatment only compromises the results. In some of these cases one is easily able to get control of his patient, dissipate his false conceptions of his troubles and to dispel his phobias. Others are more obstinate and many times will test the ingenuity and logic of the physician, but he must at all times be in command and master of the situation, and need not be discouraged if results are not immediately permanent. It is always to be borne in mind that most of these individuals have suffered a long time and that it will require some time and patience to erase these false impressions from the patient's mind. *Materia medica* is not to be ignored. Many of these patients are anemic, and of course are to be treated accordingly. They should be given a sound body in so far as it is possible to do so. Constipation should always be avoided or overcome, and this with little or no internal medication. Any patient who is constipated suffers from a greater or less degree of autointoxication, which is very deleterious in all cases, and especially so in the neurasthenic. In most instances constipation itself is a functional disturbance and can be successfully treated as such.

Pollakiuria without increased amount of urine is often of nervous origin. If the urine is normal in character and amount and there is no organic disease of any of the genito-urinary organs, even though the patient complains of being compelled to urinate every thirty minutes or every hour day and night, he can be assured of a cure. Without telling him the normal amount of urine for twenty-four hours, have him measure the entire quantity for two or three consecutive periods of twenty-four hours each and report with a specimen for examination. Having duly proven the normal quantity and character of the urine and the integrity of the organs themselves, one is in position to emphatically declare to his patient that he has no disease of the kidneys or bladder, but that the cause of his trouble is purely nervous. It must then be explained to him that the capacity of a healthy bladder is from eight to ten ounces, and that since he is passing about fifty to sixty ounces in twenty-four hours he has no right to urinate more than five to six times a day. He will insist that the demand is imperious and must be obeyed. He must be informed that nothing gives rise to a desire to urinate like thinking about it, and that he must remember that he has no organic disease and that he should pass his urine but five or six times a day, the

same as every other healthy individual. If your diagnosis is correct and you skilfully manage the patient, satisfactory results must necessarily follow.

Phosphaturia is very frequent among this class of cases. It may be so marked that the urine is cloudy, or there may be even frothing as it passes from the urethra. Careful inquiry into the patient's habits as to diet and drink may explain the condition, and a few drops of nitric acid in the urine, with a proper explanation to the patient of the meaning of the condition and the test will dispel from his mind any gross error in his interpretation of the cloudy urine. However, phosphaturia must not be mistaken for bacteriuria and vice versa.

Onanism and its effects on the general health have been exaggerated, and many young men are sexual neurasthenics because they have been led to believe that their early practices—or, perhaps better malpractices—have so undermined their entire physical constitution and so disordered their sexual organs that they can never again become normal. This is certainly an erroneous conclusion, as it has been estimated by those who have investigated this subject that a very large percentage of all boys practice masturbation more or less. This is not to be marvelled at when we consider that sexual desires appear at an age before reason is well formed. Usually this habit is discontinued when he becomes a little older and is endowed with a better knowledge of morals and of things sexually. I would not leave with you the impression that such practices oft-repeated, or that sexual excesses have no ill effects, for they do, and we are all familiar with just such cases. The point I wish to emphasize is that the mere fact of this early error does not condemn the individual either morally or sexually. Most of these patients who come for advice will blushing confess their early practices and ask if anything can be done to overcome the damage done at that time. They suffer from ideas of "lost manhood," atrophied sexual organs, imaginary varicocele, sexual impotence and divers and sundry other imaginary conditions. These ideas are often due to books and pamphlets published by quacks and charlatans on the dangers of masturbation. Often the beginning of this sexual neurasthenia can be traced to the time when the patient read some literature as above mentioned.

A thorough physical examination, careful instructions as to the proper food, exercise and hygiene, with a positive assurance that his former indiscretions have nothing at all to do with his present condition and must be entirely forgotten, will often bring about a healthy confidence that means success.

Nocturnal emissions are usually physiological and their frequency within physiological limits will vary with different individuals. Unless they are abnormally frequent, in which case there is a cause, such as chronic urethritis, prostatitis or seminal vesiculitis, the patient's mind can be put at ease concerning the "terrible drain on his constitution from

these night losses." Again, it must be determined that there is no organic trouble; then proceed as in other functional disorders.

There are some men who think their gonorrhea is not cured simply because they think they have noticed something which to them seems a variation from the normal. On the strength of their statements and their diagnosis, without even a superficial examination by the physician, they are given strong hand-injections of the silver salts, zinc sulphate, etc., with internally large doses of oil of sandalwood, copaiba or methylene-blue. The local treatment does no good, but positive harm, by creating a real from an imaginary inflammation, while the internal medication produces gastro-intestinal disturbances, which only add fuel to the flame. The second condition of these men is far worse than the first. After these patients have gone from one physician to another and have received the same treatment, with possibly slight variations, but always with the same unsatisfactory results, they become confirmed gonorrheal neurasthenics. They believe they have a urethritis that will not heal, that they are beyond all hope of recovery, and that marriage will never be safe for them. The picture of moral and mental despair that they present is truly a sad one. The majority of these patients are well, in so far as infection is concerned, and if a careful and thorough examination proves them to be free from infectious germs, they must be assured that they are all right and that further treatment is not only not indicated, but that it would be positively injurious. The local condition is no longer the seat of disease and it becomes the duty of the physician to correct the psychic disturbance.

Great care and caution should be observed in not making an inverse suggestion to a patient, for by one indiscreet remark a false idea may remain with him that will be very difficult to correct or eradicate. The disease can be created entirely by the physician himself. I can best make this point clear by referring to such a case. Mr. A., aged twenty-four, bookkeeper, pathological and venereal history negative, consulted a physician months ago for a sore throat. The physician, while examining the throat, made the remark that "it looked suspicious of syphilis." The idea of the possibility of his having syphilis, coupled with his dread of the disease, so occupied this patient's mind that he could not sleep, his appetite was gone, and he could not perform the duties of his daily work with any degree of satisfaction. He was always thinking about this "terrible disease." He had experienced no other symptoms that could be attributed to syphilis, but this became his one all-absorbing thought. After a short period of treatment with the first physician, he came to me for treatment for his syphilis. Not being able to find any evidences nor to get any history of syphilis, I kept him under observation for some weeks. After assuring and reassuring him that he had no such disease, he finally agreed that I was correct. Every few weeks he would suffer a relapse and return in a very despondent mood, thinking that possibly

I might have been mistaken. Every little redness of the skin or pimple that he discovered set him to thinking, and the more he brooded over it the more fixed became the idea that he surely was a terrible sufferer from that "awful disease." It required a very strong talk to get him right again, but he always yielded and went from the office a very much relieved individual. He had been changed from a man of light heart and cheerful nature to a condition bordering very closely on that of melancholia. These few months were months of misery to him, all on account of a single remark, thoughtlessly made.

Many other functional disorders of the genito-urinary system could be mentioned, but I trust enough have been considered to emphasize the fact that they do exist, that they are deserving of our serious consideration, that they are of psychical origin, and that they are amenable to psychical treatment.

THE VALUE OF AUSCULTATION IN THE DIAGNOSIS OF
FRACTURED RIBS.

By S. T. LIPSITZ, M. D., of St. Louis.

A recent experience during a service in one of the Municipal Clinics, with cases in which fracture of one or more ribs was found, has demonstrated to me the great value of auscultation as a help in diagnosing these injuries. Hitherto we have depended almost entirely upon manipulation and palpation for the elicitation of crepitus and abnormal mobility, resorting also to the Roentgen rays.

Previous to adopting auscultation as a necessary means in the diagnosis of these conditions, I had the usual difficulty which arises in a large number of cases in the hands of all practitioners, in endeavoring definitely to diagnose the cases that come under their observation. The Roentgen rays, though very valuable, for obvious reasons are not always practical.

Although the examiner is frequently able to obtain abnormal mobility on palpation and manipulation, many cases are met in which this cannot be demonstrated. Often it is impossible to obtain crepitus by manipulation. Crepitus is the one sign sought for most assiduously in fractures of all kinds on account of its great diagnostic value. By moving one or both segments of the broken bone the crepitus is transmitted to the fingers. This procedure is usually very painful to the patient. The crepitus may also be produced in the respiratory excursion and conducted to the palpating fingers. This method, however, is often unsuccessful.

Therefore, we have come to depend on the intensity of the pain, especially on deep inspiration, and the amount of local tenderness on palpation as means of differentiating from simple contusion. In these cases it has been the practice to depend more on subjective symptoms than on signs. The literature on this subject is not comprehensive and tends to show that auscultation in the diagnosis of fracture of ribs has not been systematically employed with sufficient thoroughness to determine its exact value. Many authors do not give it a place in their works. Others mention it very briefly, and a few ascribe to it some value. In Keen's "System of Surgery," Eisendrath makes the following statements, the second of which deals with auscultation: "Crepitus can seldom be elicited and no great weight should be laid upon its absence." If this is proved true, then the diagnosis of fractures in these parts is primitive, indeed. "Occasionally crepitus may be heard through the stethoscope. The crunching noise of bony crepitus must be distinguished from that due to emphysema in the skin or a pleuritic rub." Stimson states that

crepitus may be heard sometimes on auscultation. Rose and Carless speak of it in similar terms. Riedinger and Kuemmell remark in von Bergman's "System of Surgery," that in the vast majority of cases crepitus is absent and that localized pain is the safest guide. Scudder informs us that the stethoscope placed near the supposed fracture will often assist in detecting it. In the "American Practice of Surgery," Duncan Eve makes the statement that crepitus is not always present but may be determined by careful palpation and auscultation. It is true that the results described in this paper are based upon a comparatively small number of cases (eleven in which auscultation was successful), but the number is large enough to give the conclusions sufficient weight to render them acceptable. It is hoped that other observations will follow which will corroborate or disprove the statements found herein. To the trained ear there is considerable difference between the sounds of a pleural rub and a fractured rib. The crepitus of interstitial emphysema is usually elicited by palpation and when obtained by auscultation should not mislead the examiner. In a word, the sound obtained over a fractured rib is characteristic, is unlike the sounds of pleural rubs, air crepitation or râles and is therefore pathognomonic.

Direct auscultation is not as satisfactory as the indirect method with the aid of the stethoscope. The Bowles stethoscope is preferable because it intensifies the sounds produced. Have the patient inspire as deeply as possible. The sound is usually best elicited at the height of inspiration or during the beginning of expiration. On listening in this way, it is with rare exception that any fracture of a rib can escape the examiner's notice. In two cases of the series there were multiple fractures. The exact site of each lesion was located without difficulty. In three cases the diagnoses were made by auscultation alone, palpation and manipulation giving negative results. This was explained by the knowledge that the severe pain produced by manipulation lessened the efficiency of this procedure, and that mere palpation was not sufficiently delicate. In all the other cases in which manual methods gave positive results auscultation was correspondingly successful. In a number of cases of suspected fracture not included in the series careful auscultation was unsuccessful and invariably the results of palpation and manipulation were also negative. Other diagnoses were made.

One may listen over almost any part of the affected side and elicit the peculiar hard, grating, breaking sound or the "click" which emanates from the site of the fracture. It is easy to comprehend that if it is possible to obtain these sound-like impulses by means of the sense of touch, it must follow that the sensitive ear with the aid of the stethoscope can detect the same sound-wave impulses. If soft vesicular breathing or the finest crepitant râle is audible, then surely a break in a rib, almost next to the stethoscope, will make itself heard when the segments of the bone rub against each other. Once this sound is discovered over any portion

of the chest, it can be followed in the direction of its increasing intensity, until, where it is most pronounced, the site of the fracture is located.

As a rule, with practice, if more than one fracture is present all the lesions can be found in this way. This sign is so reliable that it is seldom necessary to send a patient away with a doubtful diagnosis. Occasionally manipulation is required as a simultaneous adjunct to auscultation if the respiration is so shallow that it fails to produce any bone-sound. Unusual incomplete fractures are about the only type that do not become manifest after such an examination. Even in the most experienced hands many cases of injury to the chest are treated with much doubt or complete ignorance of the actual existing condition. In very muscular individuals, in the fat, in women with the injury in the region behind the breast, crepitus and abnormal mobility are unusually difficult to obtain. As was previously mentioned, in these cases it has been the practice to depend more on subjective symptoms than on signs. In such cases auscultation is very successful. It affords the patient a minimum amount of pain which of itself makes this method desirable. Its intrinsic value depends upon two factors: the refinement of the means of sound-perception and the ability to examine at greater length and with less interference from the patient by minimizing the pain.

Auscultation should be employed in all cases of injury to the chest where there is either ignorance, doubt or knowledge of fracture of ribs for the following reasons:

It succeeds when other methods fail and is therefore more exact.

It makes possible more accurate localization of the injury and is therefore a refinement in diagnosis.

It is successful in subjects who ordinarily, on account of pronounced muscular, adipose or mammary development, render other methods unsatisfactory and unreliable.

It affords the patient a minimal amount of pain, which is of two-fold value as the diagnosis can be made with greater accuracy and ease.

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MEDICAL AND SURGICAL PROGRESS.

"606": EHRLICH'S NEW SPECIFIC FOR SYPHILIS. "THERAPIA STERILISANS MAGNA."

A REVIEW OF RECENT LITERATURE.

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27. UEBER UNERWUENSCHTE NEBENERSCHEINUNGEN NACH ANWENDUNG VON DIOXY-DIAMIDO-ARSENOBENZOL—606—EHRLICH-HATA.—Bohac und Sobotka (*Wien. klin. Wochenschr.*, August 4, No. 31).
28. UEBER BLASENSTOERUNGEN NACH ANWENDUNG DES PRAEPARATES 606 ERWIDERUNG.—P. Ehrlich (*Wiener klin. Wochenschr.*, August 4, No. 31).
29. TAGESGESCHICHTLICHE NOTIZEN.—(*Berliner klin. Wochenschr.*, No. 35, p. 1647).
30. KRITISCHE BEMERKUNGEN ZUR EHRLICH-HATA BEHANDLUNG.—Blaschko (*Berl. klin. Wochenschr.*, 1910, No. 35, p. 1611).
31. ARSENOBENZOL BEI SYPHILIS.—Spiethoff (*Muench. med. Wochenschr.*, 1910, No. 35, p. 1822).
32. UNERWARTETE RESULTATE BEI EINEM HEREDITAEREN SYPHILITISCHEN SAEUGLING NACH BEHANDLUNG DER MUTTER MIT "606."—Duhot (*Muench. med. Wochenschr.*, 1910, No. 35, p. 1835).

33. BIETET DIE INTRAVENOUS INJEKTION VON "606" BESONDERE GEFAHREN?—Ehrlich (*Muench. med. Wochenschr.*, No. 35, p. 1826).
34. BERICHT UEBER DIE BISHERIGEN RESULTATE DER BEHANDLUNG DER SYPHILIS MIT DEM PRAEPARATE VON EHRLICH-HATA (120 FAELE).—Pick (*Wiener klin. Wochenschr.*, No. 33).
35. BEHANDLUNG DER SYPHILIS MIT DEM NEUEN EHRLICH-HATA'SCHEN ARSENPRAEPARAT.—Hoffmann (*Med. Klinik* (Berlin), VI., No. 33, Ex. from *Journ. Amer. Med. Assoc.*, Vol. LV., No. 12, p. 1062).

Years of experimentation in the chemotherapy of protozoan infections with the Schaudinn-Hoffman discovery of the spirochæta pallida, classifying syphilis in this group of infections, placed Ehrlich in a position to make possible one of the greatest therapeutic discoveries of the age. His earlier work relating to the use of arsenical compounds in the treatment of spirillum and trypanosomal infections was more or less successful. His new preparation, "606" (Dioxy-diamido-arsenobenzol) and the later modification, "Hy 606," apparently surpass in specificity all other remedies for these diseases.

The first report upon this chemical specific was delivered before the Congress of Internal Medicine at Wiesbaden last April by Ehrlich's co-worker, Dr. Hata. Previous experimentation had proven that one injection of this preparation would immediately destroy protozoan disease in animals. One injection freed infected animals from trypanosoma, spirillum or spirochæta—hence the name, "Therapia Sterilisans Magna." Experimental syphilis in rabbits was relieved as rapidly as infections due to other protozoa. The spirochætæ disappeared completely in twenty-four to forty-eight hours after a single injection. No untoward results were observed from doses less than 0.15 gm. per kilo-weight of the animal. These results induced Ehrlich to have others try this preparation in spirochæta infection in man, among whom were Wechselmann of the Dermatological Clinic in the Rudolph Virchow Hospital in Berlin, Schreiber of Magdeburg, and Hoppe and Alt in Uchtspringe. The clinical results observed during the short period of experimentation with the new remedy conclusively demonstrate its specific action, and the reports of all the investigators are most promising with regard to its probable value as a therapeutic agent.

In Wechselmann's first report on eighty cases, treated with this preparation, there was remarkable and favorable reaction in all but three cases. Two of these failures were cases of congenital syphilis and showed at post-mortem multiple milliary gummata of the liver, heart muscle and meninges. In a case of lues, complicated by a severe pernicious anemia, death resulted eight days after the injection. As most of the arsenic is supposedly eliminated within a few days after the injection, this treatment was not held accountable for the death. He gives a detailed report of the action of this drug upon various malignant types of syphilis, some of which had reacted to prolonged administration of mercury, iodides, and other arsenic preparations (Atoxyl, etc.), with very little improvement, or showed frequent serious recurrences. These cases improved almost immediately, the lesions disappearing within a few weeks, after an injection of No. 606. The spirochætæ left the initial lesions within twenty-four to forty-eight hours, and in one to three weeks the latter were completely healed. The more severe skin and mucous membrane lesions, extremely

persistent under other forms of therapy, disappeared in all cases within one to two months.

His assistant Lange, who made Wassermann reactions on these cases at two-week intervals, reports that this reaction became less and less positive and finally negative. The blood was examined by Hirschfeld and showed only a slight leucocytosis. No bad effects occurred in the heart or gastro-intestinal tract, and no changes were found in the urine. The action of this preparation upon the eyes was very carefully observed, since other arsenic preparations have fallen into disuse on account of the serious results they produce upon these organs. In the cases observed by Fehr, there were no abnormal findings in the fundus or disk. In a case of papular syphilis, with optic neuritis, which had been previously treated for six months with inunctions, no further unfavorable changes of the disk occurred under this treatment. The intramuscular injection used in these cases produced more or less pain, lasting from one to six days and frequently required narcotics for its relief. Usually more or less edema and infiltration of the entire gluteal region followed the injection and frequently the temperature rose from 100° to 103° without any other disturbance of the general condition.

Alt reports on the action of this preparation upon para-syphilitic lesions, tabes, general paresis, etc., from his results in twenty-three cases. Most of these had been treated with other arsenic preparations (Arsenophenylglyzin). In eighteen cases giving positive Wassermann reactions, two were changed to negative, two showed a marked decrease, and three a moderate decrease of the positive reaction. He observed a number of excellent results, one patient reacting to such an extent that he was able to resume his occupation.

Neisser believes that this new preparation produces its rapid effect by acting upon the products of syphilis as well as upon the spirochætæ themselves. He reports an interesting case of cerebral lues with optic atrophy, paresis of the eye-muscles, and severe headaches, which, after having been treated for half a year without any material improvement, rapidly cleared up after one injection. He doubts the efficiency of .3 and .4 gram doses, and is inclined to believe that larger amounts are necessary. Neisser observed that the injection of "606" was followed by leucocytosis, one count having been as high as 38,000. He attempted to determine its prophylactic value by inoculating animals, and found that those who received .25 gm. per kilo-weight of Ehrlich's specific at the same time of their inoculation with spirochætæ, showed a less pronounced and later initial lesion than those who had not been thus injected. From these few experiments he concludes that its prophylactic action is only of short duration.

Schreiber and Hoppe attempted to improve the technique of giving this preparation on account of the pain and local inflammatory reaction which occur at the site of the intramuscular injection. After an extensive and successful experience with intravenous injections in animals, and knowing that Iversen of St. Petersburg had used it intravenously in recurrences of other protozoan diseases, they felt justified in trying this method of introduction. In thirty cases which they injected intravenously, they had no ill results of any consequence. In two cases arsenic eruptions occurred about the tenth day after the injection. The good effects observed by others were obtained in all of the cases treated in this manner. Eighty-four per cent. of them gave a negative Wassermann reaction after fifty days, and ninety-two per cent. were finally negative. Hoppe observed

that after intramuscular injections the urine was free from arsenic in five days in the acute cases and in ten days in the parasyphilitic cases; but with intravenous injections the arsenic was excreted at the end of the fourth day. There was no methemoglobin or abnormal findings in the urine after these injections. They increased the doses to .6 or .7 grams without having any bad results and are inclined to believe that this amount is necessary to prevent the recurrence of the symptoms of the disease. The presence of spirochætae in the initial lesions forty-eight hours after the injection or the recurrence of a Herxheimer reaction indicates that a larger dose should have been given. In four cases in which doses of increasing size were given intravenously, they observed no unpleasant effects and noticed a much more rapid disappearance of the lesions and no recurrence.

Fischer and Hoppe report the finding of arsenic in the urine, stools, and tissue. After giving arseno-phenyl-glyzin injections subcutaneously, arsenic was found in the urine varying from the seventh to the tenth day. After injecting Ehrlich's preparation (606) intramuscularly, it was sometimes found in the urine as late as the tenth day. When this was given intravenously (0.3 gm.) the urine was negative after the third day. In two patients, who died from intercurrent sepsis and came to post-mortem fourteen days after injection, no arsenic was found in the internal organs. In one case there was a trace of arsenic in the gluteal muscle thirty-six days after injection. Arsenic disappeared from the blood within fourteen days.

Hallopeau, in an exhaustive review of the many arsenic preparations, states that Ehrlich's remedy destroys syphilis and is superior to mercury and iodide of potassium. He says, however, it is of such recent date that, in his opinion, it is too early to say whether it is absolutely curative. His observations show that it is very destructive to the spirochæta pallida in the chancre, and its action upon other lesions appears to be rapid and to have no serious sequellæ.

Nichols made a preliminary report of the action of Ehrlich's substance (606) upon the spirochæta pertenuis in animals and published four cases in detail, demonstrating the rapidity with which this drug affected sprue. In all these animals no spirochætae could be found twenty-four hours after an injection. The lesions disappeared after two or three days and the serum reaction was negative in three out of four cases at the end of three days. He was so favorably impressed with the results produced by this drug in animals, that he recommended its trial in patients affected with this disease.

Uhlenhuth and Mulzer reviewed the experimental basis of the chemotherapeutics of the arsenic preparations in spirochæta diseases and claim the right of discovery and introduction of these preparations in virtue of their earlier work with atoxyl and its modifications. They publish in detail some of their previous reports showing the effect of atoxyl upon spirochæta septicemias, and direct attention to the treatment of syphilis with a combination of atoxyl and mercury which they claim to have inaugurated and have been using very successfully during the past two years. Their results in malignant forms of syphilis, which would not react to mercury and iodine, appear almost as remarkable as the cures effected by "606."

At the time of his communication, Treupel says there had been over five hundred cases reported with unanimously good results, and gives a detailed report of nine cases which he and his co-workers had analyzed

very carefully, particularly in regard to the effect of arsenic upon the general system. They conclude that after an intravenous injection it is entirely excreted in three days, and after an intramuscular injection only in twelve to thirteen days. On this basis, he believes that on account of the slow process of excretion the intramuscular injections are preferable, since they tend to prevent a recurrence of the disease. He cites the recurrences which Iversen experienced after intravenous injections and believes that they were probably caused by the too rapid excretion of the arsenic in consequence of which the latter could not affect all the spirochætae in the body. He gives the dosage as 0.4 to 0.7 gm.

Wechselmann and Lange, in their later writings have modified the technique in giving Ehrlich's preparation, so that when given according to their method there is not that painful local reaction which proved so objectionable with Ehrlich's procedure. According to their technique, "606" is dissolved in one to two c.c. sodium hydrate solution by triturating in a mortar. To this glacial acetic acid is added, drop by drop, until a fine yellow precipitate occurs. The latter is rendered sterile and washed with one to two c.c. of distilled water, and then neutralized by a 1/10 sodium hydrate solution or one per cent. acetic acid, as necessary. The last product is centrifugalized and the sediment is taken up with physiological salt solution. This mixture is then injected subcutaneously below the scapula, the site of injection having been previously sterilized by the application of tincture of iodine. They claim that there was no local reaction or constitutional disturbance in the seventy cases injected. Should arsenic poisoning develop the drug can be immediately removed, as it lies in the subcutaneous tissue, and not in the muscles or blood.

Michaelis reports on thirty-six cases of syphilitic and parasymphilitic which reacted favorably without exception. He used an intramuscular injection of the substance after it was neutralized by means of the indicator phenolphthalein. Immediately after the injection he asked his patient to stand and to flex the thigh on the injected side several times for the purpose of distributing the arsenic. After this he placed his patient at absolute rest for a number of days. These injections were absolutely painless and in half the cases no further local reaction occurred.

Loeb observed in a case of erythromyelia suffering from syphilis a diffuse infiltration with considerable inflammatory reaction over the entire gluteal region and extending anteriorly over the abdomen. The erythromyelia, however, was not influenced by the injection. The temperature, pulse-curve and pain usually ran parallel in his cases. He observed no signs or symptoms of arsenic intoxication in any of the cases. In some instances he observed a Herxheimer reaction. Loeb reports the uniformly good results observed by others and gives the dose as .005 to .008 per kilogram of the body weight. He had an instance of recurrence in a patient who had received a small intravenous injection. In one case he found albumin and casts in the urine which he interprets as an exacerbation of a chronic nephritis, probably the complication of a previous yellow fever. The Wassermann reaction in his cases was not influenced to any perceptible degree. He believes that in the light of our present knowledge, relative to the duration of these apparent cures, there is no contraindication to further treatment with mercury and iodides.

Glueck communicates his results based upon one hundred and nine cases treated with this preparation. His technique is practically that recommended by Ehrlich. He observed the same local reaction and constitutional disturbance as reported by other investigators. In five cases

he noticed more or less general eruptions, consisting of urticaria, erythema, and in one instance a diffuse erythema simulating that of scarlet fever. No bad effects were noticed in any of the cases on the cardio-vascular or nervous system. In those cases, which had both a luetic and a tuberculous lesion in the lungs, the process seemed to be favorably influenced—the cough would disappear, and expectoration would cease. In a case of pregnancy, a multipara, an injection was given at the seventh month and twelve days later the heart sounds of the fetus could no longer be demonstrated. In another case there were no unfavorable results in mother or fetus. He considered the dose .3 gm. too small and used .4 to .5 gm. The marvelous results obtained by others in the different forms of syphilis were confirmed by him. The Wassermann reaction was made in twenty cases and proved negative in five after thirty to forty days; positive in fifteen cases after twenty-one days. The general lymphadenitis did not disappear as rapidly as the skin lesions and usually remained eight to ten days after the disappearance of the other signs. In one case a gland was examined for spirochætae twenty-four hours after the injection and was found negative. In two cases in which initial sclerosis was present, secondary lesions appeared after the injection. These, however, quickly disappeared after a second injection. Two cases of advanced progressive paralysis and one case of optic atrophy were injected with .05 gm. without any appreciable effect. One case of syphilitic icterus was greatly improved. Two cases of cerebral hemorrhage having a luetic basis were remarkably improved after two weeks. In three cases of lues, accompanied by psoriasis, the combined lesions disappeared in fifteen to twenty-one days.

Bohac and Sobotka are the first investigators to caution against the indiscriminate use of the new preparation and to point out certain serious effects which occurred in their cases. They admit that its specific action on syphilis was demonstrated in their cases, but claim there were more or less serious sequelæ, which up to the present time, were not given cognizance by other observers. They report in detail instances showing the unfavorable effects of arsenic, particularly upon the nervous, gastrointestinal and renal systems. Among these was a case of anuria that lasted over twelve hours, and another that continued for nine days, followed by a considerable period in which urination occurred only with the greatest difficulty. The peculiar feature was noticed that in those individuals receiving the least arsenic the more serious symptoms were noticed only after some time. In two cases variable quantities of albumin but no casts were found in the urine. In all of their cases there was a loss of the patellar and certain other reflexes. Very severe tenesmus occurred in two instances, one of which was probably caused by an intercurrent proctitis. In three cases there was obstinate constipation that required laxatives for its relief.

In their second communication Bohac and Sobotka report the later history of the three cases referred to in the preceding abstract. The complete retention of urine lasted for ten days in one case, the rectal tenesmus a little longer. The reflexes behaved better at the second examination; the knee-jerk could still not be elicited reclining, but could be elicited with more or less facility when the patient sat up. They add further that three other patients have returned with new periosteal gummata, new eruption of papules or pustulization of the old eruption two or three weeks after the apparent cure under the single dose of 0.3 gm. of the "606." They state further that the syndrome they observed in the three cases presenting

untoward symptoms differed entirely from that of methyl-alcohol intoxication as depicted by Robert and by von Jaksch.

In a telegram to the editors of the journal in which the work of Bohac and Sobotka appeared, Ehrlich expresses regret that the latter had not advised him at the proper time of their experiences with disturbances after giving the "606" in three cases before publishing them.

"If they had informed him of their experiences, he adds, the sensational disquietude caused by their article might easily have been avoided. He says, that one hundred and thirty-two other vials of the same stock of "606" were sent to five other hospital physicians and none has had any untoward experiences with it; that Sellei and he himself think that the disturbances reported by Bohac and Sobotka are symptoms of a typical methyl-alcohol intoxication; and that the trouble was due to the injurious action of a possibly impure methyl-alcohol. The powdered drug had been rubbed up with a little methyl-alcohol before dissolving in water, according to Ehrlich's directions and practice.

Maximilian modified the original method of intramuscular injection by adding morphine chloride (.05 gm.) to the drug as it was first prepared. Nine to ten c.c. of this mixture were injected into each gluteal region and in this way the dose was gradually increased from .3 to .5 gm. After these injections acetic acid, citric acid and sour wines were interdicted except in alcoholics, to whom wine was allowed. Local reaction and pain rarely followed, and only a slight fever was occasionally observed. Patients who had previously received mercurial treatment claimed that these injections were less painful than the former. It is advisable to note whether blood can be aspirated into the syringe before injecting, in order to avoid the possibility of injecting the remedy directly into a blood vessel. The subjects were compelled to rest for an hour after the injection. Special precautions were taken with Poles and Tyrolese, to avoid the temperature reaction, which these races usually exhibit after all operative procedures. In the detailed reports upon thirty-one cases, there is particular mention made of the febrile reaction. In the majority of these there was only a mild fever lasting a few hours. In eleven cases the temperature rose two degrees and in one case four degrees. The severest fever occurred on the third day following the injection and lasted twenty-four hours. The majority of patients were troubled with obstinate constipation which was relieved by *magnesia usta*. A painful local reaction occurred in four cases, one of which required a second morphine injection.

Spatz, in his second communication on the use of "606," reports the course of five cases which appeared in his first article. Quoting Ehrlich's letter he states, that inunctions of mercury or a second injection of "606" should be resorted to in all those cases, (1) which show Herxheimer's reaction twenty-four hours after the injection; (2) in which living spirochætae can be demonstrated twenty-four hours after the injection; and (3) in which the symptoms or signs react slowly after the administration of the drug. In some cases the motility of the spirochætae was greatly diminished after the injection of "606," but in others inoculations with organisms taken from initial lesions proved positive. In using Wechsellmann's method—the subcutaneous injection of a neutral preparation—he experienced less local and general reactions than with the intramuscular injection. According to his results the new specific was particularly effective in those forms of syphilis which had not reacted to other therapeutic methods. A dose of .5 to .6 gm., depending upon the virulence of the injection, was required for the primary lesions and not less than .4 gm. proved effective in the gummatous formations.

Wechselmann offers his final report upon five hundred and three cases treated with Ehrlich's new product. The communication is more remarkable than any of the earlier articles and can hardly be submitted to reviewal. The specific action of the drug is demonstrated by its effect in curing cases of syphilis within a few days. Some cutaneous lesions disappeared almost completely in twenty-four hours and mucous patches were apparently healed in forty-eight hours without the aid of any other treatment or the withdrawal of traumatizing agents, such as smoking. The beneficial results obtained in the graver cutaneous and mucous membrane affections, as well as in the more serious visceral and nervous lesions receive additional confirmation in the later reports, as the cure in these instances apparently seems to be permanent. Of the various cutaneous lesions the large papular syphilide showed the slowest improvement, in some instances requiring a second injection to effect the complete disappearance of the lesion. The treatment of syphilitic bone affections proved most satisfactory; several cases are quoted in which the nocturnal pains in these disorders ceased within forty-eight hours. Although Wechselmann observed no serious sequelæ in cases of diseased optic nerves, still he is inclined to withhold the drug whenever the retina is found to be affected. Visceral lues showed marked improvement after the administration of the specific; especially was this true of syphilis of the testicles and of the brain. Long standing cases of icterus disappeared in ten days. There was marked benefit in several instances of tumors of the brain, one of which had an involvement of the optic tract and was greatly improved two weeks after the injection. In the parasymphilitic diseases the results were not so definite, although there was some improvement in an early case of progressive paralysis. The more pronounced effects were seen in tabes. In several instances there was a general improvement noticed in the relief of the pains and neuralgias and the regained tone of the intestinal and vesical musculature. In the parasymphilitic affections it appears that the best results are accomplished in the early cases; in the advanced cases the process has gone beyond repair. A case of malaria was greatly improved by this treatment. In five pregnant women at term, an injection of .45 gm. produced a favorable result upon the disease without interrupting the course of pregnancy. One case of inoperable lymphosarcoma and another of psoriasis were uninfluenced by this medication. In a case of chronic lichen simplex the itching ceased entirely after one injection without any other influence upon the lesions. Wechselmann concludes that the extended use of this drug has undoubtedly proved its great value in all the different forms of active lues, and that its effects in parasymphilitic diseases have been favorable enough to justify its discreet use as a therapeutic agent.

Iversen confirms the results of other investigators by publishing his work on sixty cases treated by the intravenous method. He adds .3 gm. of "606" to 350 c.c. of sterile normal saline solution and injects it as in intravenous transfusion. Two or three hours after the transfusion a remarkable reaction usually occurs, consisting of a chill, rise of temperature, joint pains and occasionally vomiting and diarrhea. No evidence of arsenic was found in the vomitus. On the following day the patient was free from all symptoms except weakness. In four cases .3 to .4 gm. was insufficient to remove entirely the lesions in four weeks, and a second injection of .4 gm. was given. This was usually well borne and apparently produced a rapid cure. He says that further treatment with mercury and iodides was not contraindicated in these cases of recurrence. In all

of his cases there was a rapid improvement of the local as well as the general condition, and in none of them did unfavorable sequelæ follow the injection. In three cases he observed Herxheimer's phenomenon, and in these cases the positive Wassermann reaction was uninfluenced by the injection. In several instances of primary lesions, the living organisms were recovered two or three days after the injection according to the method of Burri and Tusche. In ten cases in which spirochætæ were found in the lymph-glands before the time of the injection, the use of this drug caused them to disappear in ten days. Iversen maintains that this test should be applied in all cases and that those showing the spirochætæ six days after the use of the drug should receive a second injection. The Wassermann reaction became negative in all cases in twenty to forty days, and in two cases as early as eight and nine days. At the time of his writing, none of the reactions had reverted to the positive. He concludes that this preparation undoubtedly exerts a specific influence upon the spirochætæ pallida, as is shown by the rapid disappearance of the lesions after the use of the remedy, and the rapidity of the curative process entirely depends upon the extent of the anatomical changes. He says, however, that it is entirely too premature to state with certainty whether one or two injections will completely free an organism from the spirochætæ and prevent the sequelæ of the disease.

Tæge treated a case of pregnancy at term with an injection of "606." The child developed the classical symptoms of congenital syphilis ten days after birth, but these cleared up entirely after a second injection of .3 gm. On analysis the mother's milk showed no arsenic by Marsh's test. This case is cited to show the endotoxins, which are thought to be liberated by the action of the arsenic, had no unfavorable effect upon either the mother or the child.

In Herxheimer's seventy-two cases, no toxic effects were observed, with the exception of one case, a neurasthenic in whom retention of urine occurred, which was relieved by an ordinary sitz-bath. The reflexes, which were observed carefully, remained normal in all of his cases. The fundus, internal ear, lungs, liver and kidneys remained absolutely unchanged in all of these instances. The dosage ranged from .3 to .5 gm. Clinically the symptoms cleared up very rapidly, but the lymphadenitis persisted longer than the other lesions. In one case the initial lesion remained four weeks after the disappearance of the other signs. The average time required for the cure of a chancre was eight to fourteen days. Cases of malignant syphilis reacted with extraordinary rapidity. Three cases that had resisted other forms of treatment were apparently cured in ten days. Spirochætæ disappeared from the initial lesions within forty-eight hours in all the cases examined. In four cases of primary infection giving a negative Wassermann reaction, the latter became positive in four, six, nine and twenty-eight days after the injection. Two cases in the primary stage changed to negative in seven to twenty days after the injection. In five cases of secondary lues this reaction became negative in one to five weeks, while in four cases of this kind, the Wassermann reaction was negative at the end of a week and a half, and in fifteen it was uninfluenced. Recurrences were not observed during the twelve weeks of experimentation with this specific. In comparing this treatment with calomel injections which he believes will cause the disappearance of the spirochætæ in some of the skin lesions with equal rapidity, he states that, according to his limited experimentation with "606," the latter seems to exert a more specific action upon the mucous membrane and other more

malignant lesions of syphilis. According to this authority there are certain indications and contraindications as to its use. It is indicated (1) in all those cases where a rapid action is desired to prevent the spread of the infection; (2) in neurasthenics; (3) in those who do not object to the pain caused by the injection; and (4) in the grave cases of internal syphilis. The contraindications are cardiac disease, optic anomalies, putrid bronchitis, and congenital syphilis. In the latter it may cause death by endotoxemia. Among his series he observed remarkable improvement in a case of psoriasis and of lichen ruber planus, after one injection of the drug.

Kromayer communicates his results in twenty-seven cases in which there was marked improvement in both subjective and objective manifestations. He reports a number of cases which failed with other treatment, but reacted promptly to this new specific. In three cases he had recurrences after one injection of .3 gm. and these were then treated with mercury salicylate. He claims that mercury treatment in these cases is not only indicated, but seems to have a more curative effect after an injection of "606." In sixteen of these cases controlled by the Wassermann reaction, four became negative, nine remained positive, one continued negative, and in two a negative reaction became positive. He believes that, if the material is exactly neutral and injected very slowly, the intramuscular method of injection is much less painful. A febrile reaction was present in nearly all his cases. He believed that this agent owes its efficacy, first to its rapid absorption of the tissue in the syphilomata, and secondly to its stimulation of epithelial proliferation, which produces a rapid healing of the lesion. His conclusions are as follows: (1) That this agent undoubtedly produces a rapid healing of all syphilitic lesions; (2) its effectiveness in preventing the later lesions is not sufficiently well established to justify the omission of mercury and iodides; (3) it is indicated in all those cases which do not respond to other therapy; (4) it should be used whenever the disease is to be rapidly checked; and (5) in all initial lesions the treatment should be immediately instituted for the purpose of attempting to abort the infection. Blaschko maintains that it should not be assumed that Ehrlich's discovery has solved the problem of the treatment of protozoan infections; on the contrary, it has merely opened up a field for the solution of many more problems presented by its introduction. He views the most important of these most critically under the following divisions: (1) The preparation itself and the form of injection. In the form of acid salt it is not stable for any length of time; and when given as a strong alkali it is very painful. When dissolved in methyl-alcohol, it becomes toxic and as a neutral preparation the solution is hypertonic. If it could be given to the profession in an aseptic neutral solution, the means of preparation of which Blaschko has indicated, this would be the best form for practical usage. Another problem to solve in its preparation is whether, instead of the aqueous suspension, its base and not the chloral hydrate could be used to better advantage as a dry powder, mixed with paraffine or vaseline. Determination of its clinical stability and resorption in this form has not been made. (2) With regard to its application, he says the subcutaneous and intramuscular methods have given the best results; the intravenous injection is not without danger, and if it is thus given, methyl-alcohol should not be used as a solvent. Furthermore, the arsenic seems to be too rapidly excreted when given by this method. From his use of arsenic in other diseases,

he favors the rectal method of introduction. Fowler's solution and sodium arsenite had been given in glycerin injections with good results. This led him to try Ehrlich's preparation by rectal administration. After giving it in this manner, arsenic was recovered from the urine and its therapeutic results were observed within four or five days. While the immediate effects seemed to be as favorable as those following other methods, they were only transitory. He also tried its effect when given by mouth, but his results were unsatisfactory. He explained this by the fact that chemical changes take place which alter the drug before it is absorbed. For these reasons he advocates the subcutaneous method as being the most effective. (3) With regard to the dose, .5 gm., which Ehrlich recommended, should be considered the average dose. The individual peculiarities of the patient, the disease, and the presence of arsenic idiosyncrasy will necessitate the variation of this dose. (4) The question of the action of this preparation is still more or less theoretical. Ehrlich maintains that it has little effect upon the organs or cells of the body and that its influence is entirely upon the parasite, *i. e.*, that it is not organotrope but parasitotrope. While this explanation, based upon the side-chain theory, is the most plausible on account of the demonstrable effects of this as well as other arsenic preparations upon the protozoa, yet the selective effect of arsenic upon psoriasis and lichen—as demonstrated by the disappearance of the lesions after an injection of this preparation—brings up the old question whether arsenic does not have a selective action in the destruction of diseased tissue. Whether this is due to the direct action of the arsenic, a chemical combination of the same, or a by-product has of course not yet been determined. It can act also as a direct antibody, as the author had previously suggested in explaining the action of mercury in syphilis, which neutralizes the toxins and aggressins of the spirochæta and thereby allows the tissue cells to counteract the effects of the organisms. (5) The most important question is whether one injection will entirely cure syphilis. The many recurrences already reported prove that this is not possible in all cases, but the question whether an absolute cure is effected in any or the majority of cases is one that will require many years of observation to answer. The extraordinary rapidity of its action upon especially malignant forms of syphilis, which had reacted unsatisfactorily to other established forms of treatment, has already been demonstrated and it is probable that a more extended use of this preparation will bring forth no further results. (6) Whether repeated injections should be given or other treatment instituted after one injection in those cases which have been apparently relieved by the initial injection can only be determined by a very prolonged clinical observation. (7) Regarding the indications of "606" Ehrlich himself does not recommend its use for every case of syphilis. He considers those cases of parasymphilitics who have other organic diseases as unsuitable subjects. Non-specific diseases of the eye, heart, nervous system and cases of aneurysm are held as positive contraindications to its use. Indications for its use are given as follows: (a) Malignant cases which have not reacted to mercury; (b) all forms of syphilis in individuals who show an idiosyncrasy for mercury; (c) cases in which recurrences occur immediately after mercurial treatment; (d) cases in which relapsing lesions occur during a mercurial treatment; (e) primary lesions before the appearance of secondaries; (f) constitutional syphilis not previously treated in the primary or secondary stage; (g) in late recurring secondary lesions it should be used in combination with mercury and iodides; (h) in the so-called

parasyphilitic affections of the cardio-vascular and nervous systems it should be used only in the earliest stages.

Spiethoff reports upon his results in fifty cases, communicating the remarkable action of this preparation upon specific adenitis which occurred in a number of his cases. He confirms the results upon the initial, cutaneous, mucous membrane, and visceral lesions previously reported by other investigators. Of peculiar interest was the reaction of syphilitic glands, some of which would become very large and painful within a few hours after the injection and then within two to twelve hours would disappear almost entirely. He could not recover spirochætæ from the lymph nodes forty-eight hours after an injection. In those glands in which he could demonstrate spirochætæ he could also show areas of degeneration histologically. In one case of primary lues the Wassermann reaction was negative in four weeks, in three cases in six weeks after the injection of .6 gm. In one case after an injection of .45 gm. it was positive at the tenth week, and in one it was negative after .3 gm. at the eighth week. In one case of secondary lues a negative Wassermann reaction was obtained at the end of seven weeks. In all of the cases the reaction became less and less positive up to the eighth week. The subjective and objective reactions produced by the injection were variable. They occurred as frequently when methyl-alcohol had been used as when it had not been used in the solution. He reports a great variety of symptoms referable to almost the entire system. One death occurred within twelve hours after the injection. This fatal case was a very cachetic patient having a specific stricture of the esophagus, a healed gumma of the liver and a hyperplasia of the heart and aorta. No signs of arsenic poisoning were found at post-mortem. He said that Ehrlich attributed this death to the shock produced by the pain of the injection. In one case of pernicious anemia the erythrocytes were increased five hundred thousand and the hemoglobin proportionately after one injection. In another case of this disease no improvement was observed after an injection of .3 gm. of the drug. He gives as a contraindication all cases which have organic disease, non-specific in nature, and particularly those of the cardio-vascular system.

Duhot reports in detail one of his fifty-five cases in which he cured a syphilitic infant by giving "606" to its infected mother. The pregnant mother had a malignant tuberculo-ulcerative syphilide which was treated with mercury and iodides. The lesions were still in evidence when she gave birth to a child which developed in a few days typical findings of congenital syphilis. Twenty-one days after the birth, the mother was given .5 gm. of "606." Three days after this injection the lesions on the child began to clear up and it continued to an uninterrupted recovery. The mother's milk was examined for arsenic but the results were negative. The child gained weight rapidly and in three weeks was free from all abnormal signs except for a mild degree of hydrocephalus.

Ehrlich gives as his opinion that the cause of death in a case reported by Fraenkel and Grauben was not due to the intravenous method as claimed by them nor to the drug itself as might be suspected. He says that the post-mortem report, which is as follows: Diffuse encephalus, cerebral softening of the left temporal and part of the parietal lobe, hydrocephalus internus, anemia and edema of the brain, leptomeningitis chronica of the vertex, hyperemia and edema of the lungs, atrophy and fatty degeneration of the heart, splenic tumor and hyperemia of the liver—is enough to attribute the cause of death in this case to the

anatomic-pathological changes. Two other cases of terminal syphilis have died shortly after the injections, one of which was subcutaneous, and the other intramuscular. On the other hand the intravenous method has been used so extensively by other investigators, in one case with a dosage of one gram, that he believes it is as safe in cases having no contraindications as any other means of applying this drug. He says that smaller doses from .3 to .5 gm. should be used intravenously in those cases in which the drug is partially contraindicated. He gives as absolute contraindications for its use severe diseases of the brain, arteriosclerosis, functional disturbance of the heart, especially angina pectoris. He cites the report of Schultz of Strassburg as an indication of its harmlessness even in specific cachexia provided no contraindications are present. Schultz reports forms of tertiary syphilis in extreme emaciation, in which an injection of .45 gm. was well borne and was followed by considerable improvement. He says that probably the intravenous injection is the least harmful on account of the rapid elimination of the arsenic was demonstrated by Hata on animals and by other investigators on man. It will entail longer observation before definite knowledge can be obtained in regard to the most valuable method of giving this drug. The intramuscular method has the most lasting and intense effects. The method of Iversen in giving an intravenous injection, followed by an intramuscular one appeals to him as being productive of the best results. This method introduces the arsenic into the system more rapidly, thus immediately killing the spirochætae and the action of the drug is then further continued by means of the intramuscular injection. This method, however, must be used very discriminately.

Pick concludes that this preparation has a wonderfully constant influence upon the primary sclerosis; but more or less induration of this lesion remains for a long time after the injection. In ten of the cases which he injected before the skin eruption appeared, this eruption remained absent up to this time (twelve weeks), and the Wassermann reaction in all the cases has remained negative. Macular and maculo-papular exanthemata disappeared in four days and papular syphilide in six days. The small papular lesions and the lymphadenitis were more resistant. The best effects were noticed in mucous membrane lesions. In all the cases of tertiary and hereditary lues the results were excellent. In the tuberculo-serpiginous syphilide there was a tendency to healing which was not complete. In twenty-seven cases of lues of the nervous system the results were negative except in one case of cerebral lues. Recurrences occurred in a case of malignant lues and in one case of primary syphilis. None of his cases showed the unfavorable effects reported by Bohac and Sobotka. In general, he says that malignant lues, resistant mucous patches, and primary lesions present the most favorable indication for the use of this preparation.

Wolf has modified the technique of giving "606" by mixing the drug with liquid paraffine, thus forming a fine emulsion. He injects this subcutaneously below the scapula. In this manner he claims the local painful reaction is avoided.

Hoffman states that recurrences have been observed in large numbers of cases of syphilis after treatment with "606" in the customary dosage, and that by-effects have accompanied the use of the remedy to such an extent as to invalidate the claim made for "606" that it is entirely harmless. In his experience with it, by-effects were noticed only when the drug was in an acid solution, while they were absent when a neutral solution was

used. The remedy certainly does not kill all the spirochætae as claimed, he says, as he was able in one case to demonstrate the presence of lively spirochætae in lesions on the genitals and tonsils a week after the injection of "606." In the case of a boy of fifteen with syphilitic ozena from inherited taint, the immediate improvement under "606" was remarkable. In a case of ulcerated gummata in the mouth, throat and testicles of a man of forty, high fever, pulse of 140, dyspnea and other signs, indicating central pneumonia of embolic origin and secondary pleurisy with extreme weakness of the heart, followed the injection. He ascribes this syndrome to dislodgement of a thrombus in the gluteal muscle following the injection of a very acid solution; nothing about the syndrome suggested local infection at the site of the injection. In two other cases there was considerable disturbance of the heart's action, the pulse running up to 120 and 160, and the area of dullness spreading to the right with accentuation of the second sound. These findings persisted for a few days and then gradually subsided. In another case there was a slight albuminuria. No visual disturbances were ever observed. He knows of a case in a Bonn institution in which the patient died suddenly the night after the injection. Ehrlich adds the details of this last fatal case as he obtained them by telegraph. The patient, he says, was a woman of thirty-three with syphilitic apoplexy, paresis of lower extremities, tachycardia, dysphagia and accelerated breathing. The condition in this case should have forbidden the use of "606," he declares, as he has expressly rejected all responsibility when the remedy is given to those who have organic lesions in addition to syphilis. He also excludes the metasymphilitic diseases from treatment with "606." He reaffirms that when given in the correct manner and with proper indications, the remedy is free from danger and does not induce any appreciable by-effects. Ehrlich now has the records of over 3,000 cases.

Later unauthenticated communications state that Ehrlich is endeavoring to refine this preparation with the view of perfecting its application and of reducing its toxicity. His latest modification is said to be "606 hyperideal" or "Hy-606." This preparation is reported as being one-third less toxic than the original, as has been demonstrated by experiments upon animals, and can safely be given in larger doses. Its use in man is followed by less marked local and general reaction than that produced by the original drug.

NEPHROLITHOTOMY AND PYELOLITHOTOMY.

A REVIEW OF RECENT LITERATURE.

By JOHN R. CAULK, M. D.

1. NEPHROLITHOTOMY OR PYELOTOMY.—M. Zondek (*Berl. klin. Wochenschr.*, April, 1909).
2. INDICATIONS AND PRACTICAL VALUE OF PYELOTOMY.—Perineau (*Annales des Mal. des Org. Génito-urin.*, February, 1910).
3. RECENT ADVANCES IN THE TREATMENT OF NEPHROLITHIASIS.—Daniel N. Eisendrath (*Surg. Gyn. & Obst.*, April, 1910).
4. INDICATIONS FOR THE SURGICAL TREATMENT OF NEPHROLITHIASIS, ESPECIALLY CONCERNING PYELOLITHOTOMY.—Victor Blum and Richard Ultzman (*Zeitschr. fuer Urologic*, Vol. 3, 1909).
5. DISCUSSION OF NEPHROTOMY BY THE SILVER WIRE METHOD.—Edward H. Richardson (*Johns Hopkins Hospital Bulletin*, March, 1910).

Since the time of Hippocrates, the question of the surgical treatment of renal calculus has created much concern in the minds of surgeons of each generation, and it is quite interesting to note the changes which have occurred from time to time in the handling of this malady. Thus, Hippocrates advocated the incision of perinephritic abscesses with or without the removal of the calculus which caused them; later, surgeons considered the possibility of the removal of calculi from pyonephrotic sacs before they had ruptured through the kidney, but this remained theoretical for a long time. We next find the pendulum swinging toward more radical procedures, the representative of which was Simon, who considered a calculus should be removed only when the kidney had been entirely destroyed; but if there was a great deal of healthy parenchyma left, the only method to pursue was nephrectomy. This seems quite remarkable to us at the present day, although for many years after this nephrectomy became the operation of choice in dealing with kidney stones.

Realizing that nephrectomy was rather too radical in cases where there was good renal parenchyma, Morris, in 1880, attempted to extract the calculus and leave the kidney behind; thus, he is credited with having performed the first nephrotomy, although Wm. Ingalls is said to have removed a stone from a kidney as early as October 8th, 1872, but did not report his case until March, 1882, in the *Boston Medical and Surgical Journal*. Durham also is reported by Newman (Lectures on Surgical Disease of the Kidney) to have performed nephrotomy in 1872.

Owing to the oftentimes serious hemorrhage following incision of the kidney without subsequent suture, surgeons began to look for other methods of intervention which would obviate this difficulty, attention was then drawn to the kidney pelvis, and Beck in 1881 did the first pyelotomy

for stone, drained the pelvis, and cure resulted in three months. Czerny the same year employed the method of opening the pelvis also.

These two methods, viz., nephrolithotomy and pyelolithotomy, born and reared at the same time naturally became more or less rivals, each acquiring a horde of ardent supporters. Among the most enthusiastic advocates of nephrolithotomy were, LeDentu, Tuffier, Albarran and Guyon, while Bruce Clark, Israel and Schmidt were partisans of pyelolithotomy.

With the development of kidney suturing after nephrotomy by LeDentu and Tuffier, hemorrhage, the great bugbear of renal surgery, was under greater control, and nephrotomy for stone became more generally favored. Thus, Perineau says: "Nephrotomy is easy, simple in technique, exploration is certain, healing is usually per primum, results are brilliant and statistics surpass the other methods." LeDentu and Legueu both prefer nephrotomy to pyelotomy, owing to the danger of fistula in the latter.

Even after surgeons began to suture the kidney following nephrotomy, severe hemorrhages, both primary and secondary, were occasionally encountered even though the incision had been made along Broedel's line or the zone of Zondek. But in all these cases the kidney was opened against the natural direction of the blood vessels, either by sharp cut or blunt force, so naturally large vessels were cut or torn, hemorrhage being a necessary consequence. It is only quite recently that this great detriment to the opening of the kidney has been in a great measure overcome, and it is mainly due to Max Broedel, who suggested instead of cutting the kidney as was usual, one should open the kidney from below upward by the use of blunt instruments; thus, the silver wire method reported by Richardson was employed with great success. The details of the method are described in his article, briefly it consists in passing a silver wire threaded on a Konsnietzoff-Cullen needle from pole to pole near the pelvic portion of the kidney, and by gentle traction gradually working one's way through the parenchyma without injury to any large vessels. By this means one can lay a kidney open like the leaves of a book, and will realize only a venous ooze even without compression of the pedicle. Richardson reports one case of pulmonary embolism following this method, and he thinks it was due to the fact that the pedicle was not compressed during the operation, and he is of the opinion that it should be done. This has greatly simplified the technique of nephrotomy and reduced the danger of hemorrhage to a minimum.

Zondek favors pyelotomy, as he says it is conservative, circulation of the kidney not disturbed, there is no loss of blood, no destruction to the renal parenchyma, and thinks that the idea of the prevalence of fistula is entirely overrated, especially since the suturing of the pelvic incision. The danger of fistula is rendered less probable by the methods of Kelly and Mayo utilizing the so-called "fatty facial flap," a part of Gerota's fascia, as a means of reinforcement.

Zondek advises enlarging the incision from the pelvis upward in the parenchyma posteriorly if the stone cannot be delivered through the pelvic wound.

LeDentu, however, makes the following rule: "*Ne jamais essayer d'enlever par le bassinnet un calcul qu'il est impossible d'extraire par une incision pyelique raisonnable.*" This is also Israel's idea.

Blum and Ultzman favor pyelotomy, but consider that the choice of operation depends upon the conditions present; they, however, lay great stress on the preservation of the renal parenchyma.

Eisendrath thinks that for the choice of operation, one must know the working capacity of the kidneys, the condition of the urine, whether septic or aseptic, the type of pelvis and the location of the calculus. He considers nephrotomy always indicated in the presence of an infection. If one is dealing with an intra-renal type of pelvis, a bifid or trifid type it is almost impossible, he says, to remove a calculus, unless it is located close to the orifice of the ureter. Great stress is laid by Zondek on the fact that one cannot palpate the kidney for other stones, as well during pyelotomy as nephrotomy. He also states that the selection of the operative method depends not so much on the absolute size of the stone as it does to its relation to the capacity of the renal pelvis, and the relation of the pelvis to the renal parenchyma. Attention was called by Israel to the fact that a pyelotomy could not be done unless the kidney could be freely delivered to the surface of the body, and so often during the course of nephrolithiasis, the perinephritic sclerosis or sclero-lipomatosis becomes so marked that one may experience great difficulty in freeing and exposing the pelvis and runs the risk of rupturing a vessel during the manipulations. Anatomically and clinically, according to Perineau, pyelotomy is possible only in subjects of average stature with a stone in the renal pelvis, which can be delivered through a moderate-sized pelvic wound with no perinephritis surrounding the pelvis.

The general consensus of opinion is, that pyelotomy is contraindicated in large branched calculi filling the pelvis and calyces, as attempts to remove them may cause fragmentation of the calculus with the result that some bits may be left behind, and again that the maneuvers necessary to remove it from the pelvis may so injure the pelvic mucous membrane as to be conducive to imperfect and improper healing. Whereas in nephrotomy with thorough exposure, one has free access to the whole parenchyma, calyces and pelvis, and can make a complete and thorough examination of the entire organ, also will be able to do a retrograde catheterization of the ureters, a procedure very important, and one which is extolled as one of the main factors which makes pyelotomy preferable to nephrotomy, but which seems without proper ground.

As to the lesions in the parenchyma produced by nephrotomy, Tuffier and Barth demonstrated the benignity of the operation on dogs, and found that there was produced only slight epithelial changes (glomerular and tubular), but very slight indeed, and not enough to impair the renal functions. Perineau raises the point that they were dealing with healthy kidneys, and employing simple straight incision; whereas, in nephrotomy for stones the patient is run down, the kidney function impaired and the incision is generally irregular. This is more or less true when one employs blunt force either with an instrument or finger to open the kidney after previously having made a preliminary cut into the capsule; but, if one uses the silver wire method, the kidney will be found to be opened as a rule in a straight line without serious distortion to the parenchyma, and functional tests subsequently will show, as they have shown, particularly with phenol-sulphonephthalein that the kidney function improves after extraction of the calculus, which is quite natural. There are only a few records of the post-operative pathological results of nephrotomy. Albarran (*Traité de Chirurgie*) cites two examples; his cases show a disseminated sclerosis, but we feel quite sure that had these kidneys been opened by the silver wire method, without cutting the large vessels, such marked sclerosis would not have occurred.

Another objection offered to nephrotomy is that of infarcts from the cutting of the terminal renal arteries. That these occur is true, but with the method above described the large vessels are not cut, and such lesions should not occur to any great extent.

Advocates of pyelotomy also contend that compression of the vessels of the renal pedicle during operation might be injurious, but experiments have demonstrated no serious alterations, as a matter of fact compression of the pedicle is seldom needed in the method described by Richardson.

Great strides in the treatment of renal calculus have been made since the development of the *x*-ray, by its inestimable aid, the size, number, position, and relation of the stone can be determined, and at times the condition of the kidney, but the opinion must come only from a skilled Roentgenologist, as the untrained can do an immense amount of harm, this is one of the branches of medicine that requires strict specialization. The great frequency of bilateral calculi, according to Kummell 16 per cent., collectively by Albarran, Israel, Morris and Legueu 30%, makes it imperative that both kidneys be taken. The *x*-ray picture taken in conjunction with the functional capacity of the kidneys determined by ureteral catheterization, and the conditions present at operation will enable the operator to formulate the plan of procedure, which will be of the best advantage to the patient, and to utilize the method of interference, which will most easily remove the stone, and do the least possible harm to the kidney.

The mortality of the two operations, and the fistula percentage is given below:—

NEPHROLITHOTOMY.

	Cases.	Deaths.
Kummell.	57	8
Morris.	34	1
Kelly.	25	3
Tuffier.	18	0
Watson.	14	0

Others making 309 cases in all 29 deaths—mortality 9 3/10 per cent.

In infected kidneys mortality 18 3/10 per cent.

Non infected 2 per cent.

Fistula following, 8 1/10 per cent.

The above is taken from Watson and Cunningham.

Of 118 cases of pyelolithotomy collected by Blum and Ultzman, comprising the cases of Armstrong, Von Bergmann, Cathelin, Czerny, Israel, Kummell, Morris, Tuffier and Zuckerkrandl, the mortality was 6 per cent., fistula 4 2/10 per cent.

It would seem from the statistics above, that pyelotomy had a shade the better of nephrotomy for stone, but it must be remembered that the great majority of cases operated on through the pelvis were clean cases, whereas a great number of the nephrotomy cases were septic.

FRACTURE-DISLOCATIONS OF THE SPINE.

A REVIEW OF RECENT LITERATURE.

By NATHANIEL ALLISON, M. D.

1. TRAUMATIC LESIONS OF THE ATLAS AND AXIS.—Mixer and Osgood (*Ann. Surg.*, February, 1910).
2. THE TREATMENT OF FRACTURE-DISLOCATION OF THE SPINE WITH COMPRESSION.—Robertson (*Deut. Zeitschr. f. Chir.*, 1909, ciii., p. 179).
3. FRACTURE-DISLOCATION OF THE SPINE, WITH REPORT OF A CASE.—MacLean (*Virg. Med. Semi-Month.*, January 7, 1910).
4. UNIQUE CASE OF FRACTURE OF SPINAL PROCESS.—Biscoe (*Virg. Med. Semi-Month.*, April 8, 1910).
5. CLINICAL STUDY OF CONTUSIONS AND DISTORTIONS OF THE SPINAL COLUMN, AND THEIR CONSEQUENCES, WITH OBSERVATIONS ON 56 CASES.—G. Mueller (*Arch. f. kl. Chir.*, V. 91, 1909, p. 331).

The interest which a case aroused has prompted Mixer and Osgood to investigate the literature and study the cases reported, and their research has produced a more accurate understanding of cases of upper cervical injury, and has contributed much to a clearer diagnosis, prognosis and treatment of this obscure class of cases. They found that the literature contains three important articles on cervical injuries: those of Walton, Corner, and Van Assen, in the order named. Walton's paper was the first to contain a clear description of cervical dislocations, and the first also to advise a rational method of reduction. He states that these dislocations are far commoner than is usually supposed, that they are usually unilateral, and consist of a *rotary* displacement, the upper vertebræ slipping forward and catching on the apex of the articular process below, or slipping over it into the intervertebral notch. This dislocation can be corrected after long periods of time by proper manipulations. Corner's article shows how important it is to determine the integrity of the *odontoid process*. In 6 of the 8 fatal cases that he reports the odontoid was broken. In 10 non-fatal cases it was broken once. Important, too, is the fact that of the 8 fatal cases but 2 died of paralysis soon after the injury; the others died in from twenty-three days to several years, and death resulted then from either ill-advised attempts at correction or from myelitis. Van Assen also reviews the literature, seeking points of value, and quotes Wagner and Stolfer as having found in 136 spinal injuries but one of the atlas or axis. Van Assen himself has collected 19 cases of atlas injury, but one of which was recognized before autopsy. He says that only 6 authentic cases of atlas injury have been reported. He reports 12 cases of axis fractures, in 9 of which the odontoid only was broken. It seems, therefore,

that atlas injury is rare, and that axis fracture alone has not been frequently reported. Mixter and Osgood state their belief that the commonest lesion of the cervical region is unilateral subluxation or dislocation unassociated with fracture. The rotary dislocation of Corner is of this class. The next in frequency is the *odontoid fracture*. The third type is fracture of the arches or lateral masses with or without dislocation. The immediate symptoms range from instant death to slight neck rigidity, with asymmetrical head positions. Subsequent symptoms are rigidity and neuralgias, death from attempts at correction or from slowly developing myelitis. Diagnosis is dependent on a proper radiogram, a lateral view being usually necessary. It is well to have an antero-posterior view also taken through the wide-open mouth; this will clear up odontoid injury. Provided the x-ray is not available, the establishment of diagnosis depends on observation of position and palpation. If the spine of the axis is abnormally prominent, suspect fracture of the odontoid. Disturbance of the relationship of the transverse process of the atlas, which can be palpated at a point half way between the angle of the jaw and the tip of the mastoid, should give a clue. It is well also to examine the pharynx with the patient anesthetized. Fracture of the odontoid process is difficult to determine and the life of the patient has often paid for lack of knowledge regarding its integrity. Where there is a simple dislocation of atlas or axis, intelligent manipulation offers good hope of cure, even after six months. The method of rotation reduction described by Walton is the only safe or effective procedure; traction is dangerous and unsuccessful. The literature contains no advice as to open operation, and Mixter and Osgood report the following case:—

"In light of the apparent frequency of odontoid fractures which are not immediately fatal and the common subsequent occurrence of myelitis, from the irritation caused by the abnormal mobility it seems possible that this operative procedure may have a wider range of usefulness than we had anticipated.

CASE I.—R. M., age 15, was sent to one of us in July, 1906, by Dr. Maurice H. Richardson for an opinion as to cervical dislocation.

In brief, the history is that five weeks previous he had fallen from a tree, striking his head against a limb on the way to the ground. Immediate pain and stiffness of the neck followed with the appearance of a swelling on the left side high up. The condition had not materially changed since the accident. There had been no paralytic symptoms, though there had been acute paroxysms of pain during which the boy asked to be killed. The pain radiated over the head and down the shoulder and arm.

Examination showed a thin, sick-looking boy, with a tender prominence on the left side of the neck corresponding to a forwardly displaced transverse process of the atlas. This prominence could be felt on the posterior wall of the pharynx. Several x-rays taken at this time and soon after revealed no lesion which could be accurately interpreted.

All motions of the head were restricted and painful. The chin pointed to the right. The left tonsil was enlarged. The temperature was 100° F. Further general examination was negative.

A rotary dislocation of the atlas or possibly the axis was supposed. The boy was sent to the Massachusetts General Hospital, and under an anæsthetic the head was gently manipulated by Dr. Richardson, with an apparent return to normal conditions and almost complete flexibility. This condition remained for a few days. The boy was taken home against advice, but old conditions returned very soon. Six months after the accident the boy was again seen, and as conditions were almost intolerable on account of the severe occipital neuralgia, he was again sent to the hospital and a second manipulation was performed by one of the writers. The same flexibility and apparent reduction were present after this manipulation. More x-rays failed to suggest the real lesion, and in a complete plaster helmet the symptoms were relieved for one month. The helmet was then removed and a high Thomas collar applied. In a week the symptoms had recurred with added severity and at this examination the spines of the axis and third cervical vertebræ were evidently much more

prominent than before. A fracture of the odontoid was for the first time suspected and confirmed by x-rays taken laterally (Fig. 3) and through the mouth.

The symptoms were evidently caused by the slipping forward of the atlas. The odontoid evidently showed no tendency to unite. The boy re-entered the hospital on Dr. Mixer's service and was put to bed with head extension. A leather cuirass in two pieces (Fig. 4) was made from an accurate cast taken by laying the patient in a bed of soft plaster and then making the anterior half by pouring over the chest and neck thin plaster cream.

When this accurately fitting apparatus was ready the following operation was performed. The boy was placed in the ventral position, the head being supported manually over the end of the table. A linear four-inch incision was made in the median line of the neck and carried down until the hooked spine of the axis was defined. Next the posterior arch of the atlas forwardly displaced was sought and exposed. With an aneurism needle a stout braided silk soaked in compound tincture of benzoin was passed about this posterior arch between it and the spinal cord. While forward pressure on the anterior arch was exerted through the pharynx, traction was made on the posterior arch. There was firm resistance to replacement and only a slight amount of reposition was accomplished. This was maintained, however, and the atlas firmly anchored by tying the silk band about the hooked spinous process of the axis. The wound was closed with deep silkworm gut sutures, and the leather cuirass applied and strapped tight (Fig. 4 a and b). The wound was dressed through a posterior window. There was first intention and the boy made an uneventful convalescence, with no paralytic symptoms and an absence of pain. The apparatus was worn for two months, gradually omitted, and up to the present time he has remained well, without symptoms other than slight stiffness of the neck, and has led an active life."

Robertson believes that where there exists a fracture of a body of a vertebra with compression of the cord by bone, and where this diagnosis of bone-pressure is confirmed by radiograph, an operation is demanded, and this operation should be planned to expose freely the site of the compression. A laminectomy alone is not enough, for the posterior surface of the injured body must also be removed. Also the pairs of nerves above and below the dislocated vertebra should be divided in order to prevent angulation of cord and dura. He makes a good suggestion regarding hemostasis in advising adrenalin injections to prevent the bone and dura from bleeding and the placing of provisional sutures on either side the incision which when tied will stop the bleeding. He does not regard the loss of cerebro-spinal fluid as important, using hypodermoclysis to relieve any ill effects it might cause. Patient operated upon in this way should have plaster-of-Paris supports applied as soon after the operation as possible.

MacLean reports an interesting case, one of fracture-dislocation following a fall. The patient was seen almost immediately and it was found that there was a marked depression over the eighth and ninth dorsal vertebrae, with crepitus of their spinous processes. An operation was immediately done as follows: A four-inch incision over the site of the injury exposed the spinous processes and it was found that the eighth and ninth were crushed and the tip of the seventh broken off. Upon removing them the arch of the ninth vertebra was found to be crushed and driven in on the spinal canal, while the eighth arch was fissured. Both arches were removed and the cord exposed. The cord was compressed at the point of pressure from the ninth, but not divided. The superior articular processes of the tenth vertebra showed clear, and it was found that the ninth was dislocated forward. The inferior articular processes of the ninth vertebra had either jumped or slipped over the superior of the tenth. This dislocation was reduced by prying with a chisel and manipulating the patient's shoulders, the vertebra snapping back and locking firmly. The wound was closed and the patient did well; but a

redislocation on one side took place two weeks later, and was reduced through another wound. Two months later motion had slightly returned and the bladder function was better. The outlook is good, but sensation at last report had not returned.

Biscoe's case was that of a boy of seventeen, who while playing baseball struck his head against the leg of an opposing player. This was followed by pain in the neck and limitation of motion of the head to the right. A small swelling appeared in the region of the fourth cervical vertebra and pressure here caused pain. Circulation was not disturbed, and there were no motor or sensory changes. A radiogram showed a fracture of the fourth cervical vertebra's right transverse process, with the fragment tilted upward. Treatment consisted of a Thomas collar followed by complete recovery.

G. Mueller reviews the cases he has seen of contusion and distortion of the spine and says that in spite of negative radiograms, some of these cases may have been fractures. Of 56 cases, 53 were males and the ages varied from twenty to sixty years; 38 cases were near their thirtieth year. On two symptoms he lays special stress; pain on motion and tenderness on tapping. One case recovered in thirty-two days and another was not well at the end of four years. He recommends rest in bed, plaster-jacket corsets, massage, guarded exercises, as treatment. His paper is of interest in showing that many of these injuries are not to be positively diagnosed.

RADIUM IN ITS MODERN APPLICATION.

A REVIEW OF RECENT LITERATURE.

By MARTIN F. ENGMAN, M. D.

1. THERAPEUTIC APPLICATION OF RADIUM.—Wickham (*British Journ. of Derm.*, July, 1909).
2. ON RADIUM IN THE TREATMENT OF CANCER AND SOME ASSOCIATED CONDITIONS.—Butlin (*Lancet*, November 13, 1909, p. 1411).
3. TRAITEMENT DE L'EPULIS PAR LE RADIUM.—Wickham (*Gazette des Hopitaux*, July 28, 1910, p. 1203).
4. RADIUM THERAPY.—Wickham and Degrais. New York: Funk & Wagnalls Co. 1910.
5. RADIUM'S CONTRIBUTION TO SURGERY.—Abbé (*Journ. Amer. Med. Assoc.*, July 9, 1910, p. 97).
6. TRAITEMENT DU RHUMATISME BLENNORRAGIQUE PAR LE RADIUM.—Chevrier (*Gazette des Hopitaux*, May 19, 1910, p. 807).
7. LE RADIUM DANS LE TRAITEMENT DU CANCER.—Monod (*Gazette des Hopitaux*, August 9, 1910, p. 1265).
8. TRAITEMENT DES TUMEURS MALIGNES PAR LE RADIUM.—Dominici (*Gazette des Hopitaux*, August 9, 1910, p. 1265).
9. EXPERIMENTELLE UNTERSUCHUNGEN UEBER DIE WIRKUNG DES RADIUMS UND DES HAUTGEWEBE.—Guyot (*Archiv. fuer Dermatologie und Syphilis*, Bd. 97, Heft 2 u. 3).
10. TREATMENT OF SKIN AFFECTIONS BY RADIUM.—Dr. Masotti. Preface by Dr. Danlos. Paris: Baillière and Sons. 1910.
11. RADIUM: ITS USE IN CANCER AND OTHER DISEASES.—Wickham and Degrais (*Contemporary Review*, London, August, 1910, p. 174).
12. DIE WIRKUNG DES RADIUMS AUF DIE GEWEBE.—Guyot (*Centralbl. f. allg. Pathol. u. pathol. Anatomie*, Bd. 20, No. 6).

Formerly when one thought of radium as a means of curing disease, there arose as a consequence in his mind the idea of a violent reaction. Shortly after the discovery of radium, its action upon tissue was demonstrated by an accidental burn on M. Curie himself from carrying it in the pocket of a coat. Therefore, in the early days, one naturally associated its therapeutic effect with inflammatory reaction the result of this destructive effect. We might say that the instruments used in the application of radium a few years ago were crude compared with the present advanced apparatus. The first experimenters used as their appliances boxes and tubes containing a radium salt. These simple instruments have been superseded by others which show a great advance in technique. Of the older appliance only the tubes have been retained for introduction into body cavities. Radium, similar to other startling discoveries, was hailed with excessive enthusiasm, only to be followed by the usual reac-

tion and "undeserved depreciation." This condition of affairs has largely been changed and radium has been placed upon a rational therapeutic basis by the epoch-making work of Louis Wickham. As Sir Malcolm Morris remarked, there are two great epochs in the application of radium to medicine, "before Wickham and after Wickham." Wickham's work has been founded upon the study of the physical characters of the rays emanating from radium.

There are two methods by which radium is used in the treatment of disease. First, that in which the salts of radium are dissolved in liquids which are injected into the tissues or given by the mouth, or inhaled. This is called by Wickham the emaniferous method, because in it alone the gaseous emanations are used. Second, the radiferous or filtration method, which consists of the application to the tissues of instruments containing a radium salt. The first or emaniferous method is little used in medicine on account of the great expense, as each dose employed in the course of treatment is lost. The second process consists of setting to work the powers of the invisible radiations from radium filtered through material surrounding the salt. Hence, the material of the filters and their thickness are elements capable of modifying the quality of the effective rays. Radium emits α β γ rays. The α rays are composed of atoms of matter of extreme minuteness, having a mass comparable to that of hydrogen. These are emitted with a velocity twenty times greater than that of light and are charged with positive electricity. The β rays hold a position midway between matter and ether and are electro-negative. The β rays are of three sorts, which differ in size, velocity, and penetrating powers; and from the latter point of view the α rays closely approximate to those of the β which are the slowest and least attenuated—namely, the soft rays. The hard rays are formed of particles of extreme tenuity with a velocity nearly to that of light, therefore they are very penetrating. Between the hard β rays and the soft β rays there are medium ones. The γ rays differ entirely from the other two kinds as they are not matter at all but consist of undulations of the ether similar to the Hertzian waves, light, and x-rays, and have the velocity of light but are more penetrating than x-rays. The effect of radium on the tissues is a veritable bombardment by the infinitesimal projectiles included in the α and β rays and the waves of ether in the γ rays. It is the study of the physical effect of these different rays which plays a fundamental role in its therapeutic action. To repeat, the α and soft β rays have the least power of penetration. The medium β rays pass through certain filters. The hard β rays can pass through 1 or 2 mm. of lead, while the γ rays have an enormous power (5-10 cm. of lead). The study of the proper filtration of these different rays emanating from radium has given Wickham his wonderful understanding of the value of radium-therapy and accurate methods as compared to those of a few years ago—the pre-Wickham era.

In the first place, Wickham and his co-worker, Degrais, have had a comparatively unlimited supply of radium through the Radium Institute of Paris, of which Wickham is the director. Filtration, according to Wickham and his followers, is the most important principle of radium-therapy, as it allows the selection of the different rays. Every object placed in front of the source of emission will not only diminish the total amount of radiation, but will select constituent elements according to their power of penetration. In other words, a filter depending upon its character will intercept one or more kinds of rays and allow others to pass through. A salt of radium placed in contact with the cutaneous tissues

will emit rays which will permeate their thickness and even beyond; the α rays being absorbed by the superficial layers, the three kinds of β rays going further, and the γ rays passing clean through without difficulty. Wickham and Degrais have utilized these different degrees of penetration in order to modify radiation for therapeutic purposes. A piece of cotton-wool or aluminum can be made of sufficient thickness to intercept the α rays and allow only the β and γ rays to pass through. Screens of increased thickness will intercept the soft β rays and allow the hard β and γ rays to pass through. The γ rays can only be secured by a lead screen.

In the application of radium itself, Wickham and Degrais and their followers employed two kinds of apparatus. One variety is used for external application and is covered with a special varnish by which the salt of radium is stuck on. The other variety consists of tubes containing radium salts, which are used for insertion into tumors or passages. The first variety consists of a metal base usually of copper, cut in various shapes and sizes, the edges turned up. The radium salt is rubbed up into infinitely small particles in a substance, which when raised to a sufficiently high temperature, is poured on the metal plate, allowed to dry and then resined. This Wickham calls his varnish as it soon regains its solidity upon cooling. As this varnish is transparent the little yellowish grains of radium are seen. The radio-active value of the varnish necessarily depends upon the quantity, quality and proportion to the surface of the contained radium.

In the same manner a soft flexible apparatus is made by painting linen with the radium varnish.

It must be remembered that the radio-active value of this apparatus depends upon the quantity and strength of the salts used in their manufacture. One can readily understand the eminently practical utility of this ingenious apparatus; yet the question of technique governing their use is eminently necessary in obtaining therapeutic results. The apparatus may be applied to the tissues direct or after some substance has been interposed as a screen. It is always dependent upon the tissue desired to be affected. To protect the instruments it is always well to cover them with a fine sheet of rubber or muslin.

The dosage of the radium naturally depends upon what rays are to be used or screened, the radio-active value of the apparatus, and the length of application. Short applications (from one to one and a half minutes) are particularly useful in irritable surfaces. Different effects can be obtained by the intervals of application.

In grave cases the "cross-fire" of Wickham and Degrais is a decided step in advance. This process consists in a bombardment of the tissues by rays emitted from different points at the same time, therefore crossing each other. The "cross-fire" method is best obtained by the insertion of a tube of radium in a tumor or cavity, while on the outside is laid the metallic varnished plates. It is curious to notice that Masotti appears to condemn the use of filters in the use of radium, but it seems to us that he has not sufficiently appreciated the physical characters of the rays.

The results which Wickham has attained seem to justify his enthusiasm and conclusions. Even deep processes have been affected by his methods of filtration and technique. Guyot has shown histologically a well-marked division in weak and strong radiations in the various layers of the skin. Through actual histological study, the liver cells have been found affected by the deeper penetrating rays; therefore, it is just to assume with the

modern workers that by screening off the superficial irritating soft rays, a deep neoplasm can be affected without the former terrifying cutaneous burns.

Since its first introduction into therapy, we have realized radium's beneficial effects upon superficial neoplasms, and upon various cutaneous disorders such as chronic patches of eczema, psoriasis, lichen, and allied conditions. But it is only with the modern application of the remedy that we are beginning to realize that in radium we have a remedy that promises something for the deeper processes. The work of modern investigators is still in its infancy, but the results of their work in the treatment of grave affections, such as the deeper cancers, visceral neoplasms, glandular involvements, leukoplakia, and joint-affections, seems to portend further progress.

OBITER DICTA FROM FOREIGN JOURNALS.

DR. QUÉRY'S SERUM FOR SYPHILIS.

"To begin with," says the Paris correspondent of the *Neue Freie Presse* in a letter published in the issue of September 3rd, "Dr. Quéry's reputation as an earnest investigator has been duly appreciated in the medical world. Dr. Richard Peters, of Hanover, for instance, in his address before the Twenty-seventh German Congress of Internal Medicine held in Wiesbaden in April, 1910, made the statement that 'Dr. Quéry's antisymphilitic remedy had been prescribed in 2,000 cases in the last six years with excellent and lasting clinical results.' 'I carefully weighed,' continued Dr. Peters, 'the clinical results in a large number of cases, which had been treated or which were still being treated during my sojourn in Paris, as well as the results that my own cases showed, so as not to arrive at any hasty conclusions, and I can say in all truth that my scepticism did not entirely disappear until the Wassermann reaction was negative.'"

Dr. Matsokin, of the Russian army, who is stationed in Vladivostok, has waxed so enthusiastic over the results which he achieved in the military hospital by means of Quéry's serum, that in the *Russian Journal of Skin and Venereal Diseases* (Vol. 18, No. 12) he did not hesitate to say that "all doctors who look askance at this new remedy without first giving it a fair trial are the stupid craftsmen in the medical profession, who, whenever a new discovery is made in the interest of humanity, become panic-stricken from fright." Despite Dr. Matsokin's words of praise, Dr. Quéry has not been blinded by his undoubted results, for he knows as well as any of us that it is just such enthusiastic advocates of a new discovery who do it more harm than good. Hence he is opposed to promiscuous interviews, and it requires considerable manœuvring to gain admission to his laboratory and the cages in which he keeps his monkeys.

The serum is derived from the blood of monkeys, especially the long-tailed and rhesus varieties. This shows that Dr. Quéry is not in favor of using a chemical preparation to abort syphilis. In the tertiary stage of the disease, in which mercury and potassium iodide have hitherto been thought indispensable by many physicians, the serum is just as effective as in the early stages, since Dr. Quéry has recorded a number of cases in which paralysis and tabes were not only arrested but cured. "The proof of its efficacy as a cure for syphilis," says Dr. Quéry, "occurred to me only recently and in the following manner: One of my patients, who had had the primary sore and had been treated by me with the serum, became re-infected two and a half years after the disappearance of the primary lesion. I was able to diagnose the hard primary sore a second time and treated the patient again by means of the serum."

According to Quéry's opinion, the spiral-shaped Schaudinn spirochæta pallida is not the only causative agent of syphilis, but one of many forms

of this Protean-like destructive bacillus. Quéry is of the opinion that he has discovered a rod-shaped prototype, a "syphilis bacillus." This "syphilis bacillus" has stood the test that Robert Koch always exacted in his own investigations before a definite microörganism could be declared the cause of a special disease. In other words, Quéry has succeeded in maintaining the rods in a pure culture: something which has not been achieved with the spiral-shaped *spirochæta pallida*; and with this pure culture he has infected healthy monkeys with syphilis.

"The biology of the syphilis bacillus," says Dr. Quéry, "has taught me those peculiarities of syphilitic infection which until now were enigmas that could not be solved. The rods cast off spores from which new rods, and also multifarious other forms in the shape of commas and interrogation points, develop. The multiplicity of these forms cannot be grasped by the naked eye; and what is not unimportant this multiplicity stands in relation to the multifariousness in the clinical picture of syphilis. The spores remain quiescent before they develop into rods. According to my investigations, during this period of inactivity, the spores contain no toxin, since an injection of a culture of spores is not followed in monkeys by syphilis. In this manner, I have explained to myself the intermediary stages in syphilitic manifestations—the long periods of freedom from all symptoms—followed by the most virulent attacks of the disease. In such cases the spores were quiescent until some accident caused them to sprout and develop. Hence the development of syphilis in monkeys was effected by me, not by injecting a pure culture of syphilis bacilli, but by means of the toxins contained in the culture. To separate the bacilli from the toxins I filter the culture so as to get only the toxins in the filtrate. An injection of this filtrate renders monkeys immune to the disease. After this the animal is bled, the color of the serum depending upon the variety of monkey used for the experiment. The injection of the serum is not followed by any painful reactions in the human being; in fact, the inconveniences are *nil*. To effect a complete cure twenty-five injections should be made, each injection containing one and a half c.cm. of the serum. As pointed out by Dr. Peters in his address at the German Congress of Internal Medicine the Wassermann reaction is positive after the injections and only gradually becomes negative."

Thus is made plain to us in what respects the Quéry specific differs from Ehrlich's discovery. Ehrlich advocates a chemical preparation; whereas Quéry, in falling into line with the older investigators and pinning his faith to the efficacy of an organic matter similarly to what was done to combat diphtheria, shows that he is not a Secessionist but a tractable disciple of the accepted teachings of bacteriology. Especially noteworthy is the fact that the Quéry bacillus produces specific manifestations of the disease. From a biological point of view Quéry's reasoning is illuminating; hence his investigations should be looked upon as valuable contributions to the etiology of syphilis.

DIAGNOSTIC AND THERAPEUTIC NOTES.

THE CONTINUOUS ADMINISTRATION OF DIGITALIS.—Rubow (*Hospitalstid*, 1910, Nos. 1 and 2). Most clinicians have preferred to reserve the use of digitalis, in cases of heart-disease, until signs of cardiac insufficiency showed themselves, and even then have discontinued its use at the earliest possible moment for fear of a cumulative effect. Rubow believes that the latter danger is visionary and that the cases of digitalis poisoning, which are occasionally observed, are due to over-dosage. He finds digitalis especially useful as a prophylactic measure in cardiac disease to prevent the occurrence of broken compensation. The main essential for the prophylactic use of digitalis is the administration of a preparation of known activity. He advocates especially triturated digitalis leaves, digalen, digitalone and digitalis-dialysate. In each case, the dose must be determined that acts therapeutically without toxic manifestations. He usually gives one-tenth to one-eighth of a gram of powdered digitalis leaves or one-third to one-half of a cubic centimetre of digalen daily for four or five days. The medication is then discontinued for a few days, thereupon to be resumed as before. Given in this manner, the drug may be administered indefinitely and, in his experience, with good results. He warns against the prolonged use of strophanthus in heart-disease as with this drug the toxic dose is nearly identical with the therapeutically efficient one.

APPETISING TEST MEALS.—Curschmann (*Muench med. Wochenschr.*, 1910, No. 19). Curschmann has observed that the usual test-meals, whether Ewald's test-breakfast or Leube's test-dinner, are often so unattractive to the patient, that an anacidity in the gastric contents results on account of the absence of the psychic element in the secretion of the gastric juice. We, ourselves, have observed this phenomenon more than once, especially in dispensary work, and always insist that the test-meal be served in as attractive a manner as possible. Curschmann advises that, before an anacidity is diagnosed and is made the basis for a therapeutic regimen, the patient's stomach contents be examined after he has eaten a meal consisting of his favorite dish. Thus he has given test meals consisting of sparerib with sauer-kraut, beef à la mode with salad and the like, with or without wine or beer, and believes that such a policy would greatly diminish the apparent frequency of so-called anacidities. In anacidities due to achylia gastrica or other organic disorders, this procedure never influences the findings.

THE INFLUENCE OF PSYCHIC STATES UPON THE GLYCOSURIA OF DIABETES.—Rosenberger (*Zentralbl. f. inn. Med.*, 1910, No. 16). That psychic invitation can lead to transitory glycosuria is again shown by an observa-

tion of Rosenberger. The patient, at once a neurotic and a diabetic, had for some time been free from glycosuria. On two occasions, however, business worries led to a temporary reappearance of sugar in the urine. During these periods, the total amount of solids in the urine was increased out of all proportion to the quantity of sugar excreted. It was as though the psychic irritation caused an excessive secretory activity of the kidneys, analogous to the psychic diarrheas from which the patient had suffered in his pre-diabetic period. The case is similar to that of Naunyn's Jewish banker, who registered the rise and fall of market securities by an appearance and disappearance of sugar in the urine.

We have observed a similar case in the Washington University clinic. A diabetic woman had improved under treatment to such an extent that the urine remained free from sugar even with an unrestricted diet. She had, however, a daughter who was rather wild and caused her mother much worry. Whenever the young woman misbehaved, sugar reappeared in our patients' urine.

ABDOMINAL PALPATION.—Galambos (*Deutsch. med. Wochenschr.*, 1910, No. 21). In palpating the abdominal viscera, it is of the utmost importance that the abdominal parietes be relaxed. Galambos suggests an eminently practical method of obtaining this relaxation artificially in cases in which a tense abdominal wall interferes with palpation. With the fingers of one hand, the physician presses as deeply as possible upon the abdominal wall at a point some distance from the site to be examined. The hand exerting this pressure is then moved towards the organ to be investigated, thereby relaxing the intervening abdominal wall and enabling the other hand to palpate the organ. The method is useful in all sorts of abdominal affections, but especially in the palpation of liver and spleen. It fails chiefly in cases of considerable diffuse abdominal tenderness.

THE TREATMENT OF GONORRHEA BY MEANS OF THE LACTIC ACID BACILLUS.—Watson (*Brit. Med. J'l.*, 1910, No. 4). As is well known, Doederlein's acid-forming bacillus protects the vagina against other infections. This led the writer to the thought that the lactic acid bacillus might possess a similar power. He used filtered sour milk, which is very rich in these bacilli, sometimes adding to it milk-sugar and powdered lactic acid bacilli tablets. After the genitalia have been carefully cleansed, without, however, using any antiseptics, the milk so prepared is injected. At first the discharge is increased in amount, but becoming pale and watery. Thereupon a steady improvement sets in, mild cases being cured in five to six days, more obstinate cases in two to three weeks. He has used the method in only two cases of male gonorrhea, in both, however, with good results.

CHAMOIS SKIN AS A PREVENTIVE OF BED SORES.—Morichau-Beauchant (*J'l. de Méd. et de Chir.*, Vol. 81, No. 10). Chamois skin, so called, is merely sheep skin treated in a certain fashion. Morichau-Beauchant has found it useful both in the prevention and treatment of bed-sores. It is applied with its softer side to the area of skin affected or threatened and

acts as a better protection than bed-rings or other paraphernalia with the exception of the water-bed. The latter, however, is not only expensive, but unendurable to many patients. If a large piece is used, the patient can conveniently be lifted by it.

A NEW, CONSTANT AND EARLY SIGN OF MENINGITIS.—L'Hardy (*Gaz. des Hop.*, 1910, No. 59). Signorelli's sign consists of pain upon pressure over a point situated behind the jaw, below the ear and in front of the mastoid process. It is said to be present in all cases of meningitis, to appear early even before Kernig's sign or cervical rigidity and to be one of the last manifestations of the disease to disappear. Even when the patient is comatose, pressure over this spot some sort of a reaction of defence on the part of the patient, although it is most marked during the irritative stage. Its chief value lies in those obscure cases in which it is a question whether the disease is true meningitis or merely meningeal irritation due to sepsis, typhoid, malaria or some other infection.

RECTAL AND AXILLARY TEMPERATURES IN DISEASE.—Poczobut (*Wien. med. Wochenschr.*, 1910, Nos. 17-19). The writer's conclusions are based upon 9,000 measurements of rectal and axillary temperatures in 2,200 individuals. Normally the difference between these temperatures ranges from 0.5° to 1.0° F. In cases of cardiac insufficiency the passive congestion of the more dependant parts increases this difference to from 1.5° to 2.5° F. When the difference is high, in cases of infectious disease, the phenomenon is due to an impaired myocardium. It was most frequently found in influenza, very rarely, however, in scarlet fever. The author concludes from the latter observation that the toxin of scarlatina is a nerve rather than a heart poison. In abdominal disease, an abnormally great difference between the two temperatures occurs above all in diffuse peritonitis, being often over 3.5° F. It is an early sign in appendicitis and is useful in distinguishing between intestinal obstruction and simple constipation. In uterine affections the difference is usually normal except in uterine hemorrhage, where it may be excessive. In nervous affections such as epilepsy, neuroses, neuralgias, migraine and the like, the axillary temperatures are sometimes found higher than the rectal.

BOOK REVIEWS.

MANUAL OF TROPICAL MEDICINE. By Aldo Castellani, M. D. (Florence); Privat-Dozent (Naples), Director of the Clinique for Tropical Diseases, Ceylon; Physician, Seamen's Ward, General Hospital, Colombo; Professor of Tropical Medicine and Lecturer on Dermatology, Ceylon Medical College; Member of the Royal Society's Commission on Sleeping Sickness in Uganda, 1902-1903, and Albert J. Chalmers, M. D. (Vic. & Liv.); F. R. C. S. (Eng.); D. P. H. (Camb.), Registrar and Lecturer on Pathology and Animal Parasitology, Ceylon Medical College; Pathologist, the General Hospital, Colombo; Holt Fellow University College, Liverpool, 1890; Medical Officer Gold Coast Colony, 1897-1901, University Series. New York: William Wood & Company. 1910.

The two authors of this book are both at present stationed in Ceylon and have both served in Africa, the one in Uganda, the other on the Gold Coast. They are, therefore, peculiarly fitted by training and experience for the compilation of a manual of tropical medicine. Castellani in particular may well be termed one of the founders of modern tropical medicine. It was he who discovered the etiological agent of yaws, the *Treponema pertenue*, and by means of inoculation experiments proved that yaws and syphilis are distinct infections. He has done much work in the various sporotrichoses and much of the modern treatment of tropical diseases is based on his labors. A book by such a man was certain to be rigidly scientific. The first part is devoted chiefly to climatology. The second, of over 500 pages, is a systematic digest of the various animals, parasitic and otherwise, responsible for tropical diseases. In part three, the diseases themselves are systematically discussed. Only a few of them are known, even by name, to most northern practitioners, but the strangeness and the great variety of their manifestations make reading about them a matter of absorbing interest. Incidentally, the reader will probably congratulate himself that his lot has not been cast in the tropics.

The book can be unreservedly commended. The numerous illustrations, several of them in colors, are unusually good. Anyone interested in tropical medicine will want this volume on his shelves.

INFANT FEEDING—A PRACTICAL GUIDE TO THE ARTIFICIAL FEEDING OF INFANTS.—(Oxford Medical Publications.) By J. L. Fowler, M. D., F. R. C. P., Ed. Physician to the Royal Hospital for Sick Children, Edinburgh; Joint Clinical Lecturer on Diseases of Children, University of Edinburgh. New York: Oxford University Press. 1909.

It is most refreshing to find a manual on the this hackneyed subject so clear, so simple, and so eminently sane as this little volume. Without attempting to treat the complicated questions of milk chemistry exhaustively, the author has succeeded in placing before us a most satisfactory exposition of this difficult subject. The various methods of milk modification are considered, with special emphasis on points of detail. Naturally enough a writer of the English school is not deeply concerned with fractional percentage feeding, though due credit is given to the American school for its undoubtedly great work. The author admits that *clean* raw milk is the great desideratum; practically, however, he finds that sterilization must be used when the milk supply is not above suspicion. He feels that the possibility of scurvy, "which is one of the most readily curable of all diseases, should not be allowed to stand as an argument against sterilization."

The book is really valuable, is full of information, and should be widely read. The illustrations are particularly good.

INTESTINAL AUTO-INTOXICATION. By A. Combe, M. D., Professor of Clinical Pediatrics at the University of Lausanne (Switzerland); Chief of Clinic for Children's Diseases. Together with an appendix on the Lactic Ferments with particular reference to their application in Intestinal Therapeutics, by Albert Fournier, formerly Demonstrator at La Sorbonne, Paris. Only authorized English adaptation by William Gaynor States, M. D., Clinical Assistant Rectal and Intestinal Diseases, New York Polyclinic, etc. With eighteen figures in the text, four of which are colored. About 500 pp. Cloth, price \$4.00. New York: Rebman Co.

The work is a full review of the condition, not too well understood, which we term gastro-intestinal intoxication. The process of digestion and the chemistry of the formation of toxic bodies in the intestines are considered, also the protective body-forces and how they act. An extensive chapter which offers very little definite or practical knowledge is devoted to the urinary findings in auto-intoxication. The book contains many statements which physicians trained in the medical ideas of Germany will look askance at. Though the author speaks of the bacterial cause of mucous colitis, he nevertheless speaks of the diagnostic significance of intestinal sand, uses the term arthritis, and repeatedly the term dyspepsia, etc. The author believes in the efficiency of medicinal intestinal antiseptics, adheres to the classification of constipation as spasmodic and atonic, and is of the opinion that he is able to pass the high colon tube to the cecum. The latter part of the book considers the various dietetic plans of value which the author has formed in the prevention and treatment of gastro-intestinal auto-intoxication.

RADIUM THERAPY. By Dr. Louis Wickham, Médecin de Saint-Lazare, Ancien Chef de Clinique Dermatologique de la Faculté de l'Académie de Médecine, and Dr. Degrais, Chef de Laboratoire à l'Hôpital Saint-Louis, Lauréat de l'Académie de Médecine. Translated by S. Ernest Dore, M. A., M. D. Cantab., M. R. C. P. With an Introduction by Sir Malcolm Morris, K. C. V. O. Illustrated with 20 colored plates and 72 figures in the text. New York: Funk and Wagnalls Co. 1910.

This book of Wickham and Degrais is a most excellent translation by S. Ernest Dore, and contains an introduction by Sir Malcolm Morris. Wickham is, of course, the greatest living authority on the therapeutic use of radium; therefore a completed work coming from his hands is of great value. The modern methods used in the application of radium have been largely perfected by Wickham and Degrais, consequently the book is the result of their personal experience in the use of radium in the treatment of disease. The book consists of 302 pages, with 20 colored plates and 72 figures. The illustrations are used to show the results of the various forms of radium treatment. Some of them are quite startling, especially one illustrating a large carcinoma of the cheek, which seems from the photograph to have subsided entirely under treatment. The results of the treatment of various forms of angioma by radium are striking, as are also patches of a number of chronic skin diseases. The description pertaining to the technique introduced by Wickham and Degrais is very minutely given, together with the physical problems relative to radium emanations. The last part of the work is devoted to clinical research and treatment. The book points the way to pioneer work in this field and in this regard is a classic.

CLINICAL TREATISES ON THE PATHOLOGY AND THERAPY OF DISORDERS OF METABOLISM AND NUTRITION. By Prof. Dr. Carl Von Noorden, Professor of the First Medical Clinic, Vienna. Part VIII. Inanition and Fattening Cures. Authorized American Edition, Edited and Translated Under the Supervision of Alfred C. Croftan, M. D., Chicago, Ill. New York: E. B. Treat & Company. 1910. Price, \$1.50.

Possibly no important subject in medicine is more carelessly treated by the American practitioner than that of dietetics. This must be due in great part to the fact that he is ignorant of the result which may be attained by proper methods,—results which one author classes as among the most brilliant achievements of internal medicine. A clear scientific conception of even the fundamentals of dietetics is necessary to treat successfully a large proportion of cases, especially those suffering from malnutrition and the various "dyspepsias." This much-needed knowledge is given in classic form in the hundred pages devoted to the dietetic principles involved in the treatment of chronic undernutrition and in carrying out fattening cures.

BOOK REVIEWS

HEART-DISEASE, BLOOD-PRESSURE AND THE NAUHEIM-SCHOTT TREATMENT. By Louis Faugeres Bishop, A. M., M. D. Clinical Professor of Heart and Circulatory Diseases, Fordham University, School of Medicine, New York City; Physician to the Lincoln Hospital; Late Chairman of the Section on Medicine of the New York Academy of Medicine; Member of the New York Pathological Society; Alumni Association, St. Luke's Hospital, etc. Third Edition. New York: E. B. Treat & Company. Price, \$3.00.

This is a small handbook stating both the principles and advantages of the Nauheim-Schott treatment of circulatory disturbances. The technique of the treatment is fully explained in the text and by numerous illustrations. The work is written for the practitioner so as to place before him what the author considers a valuable adjunct to other therapeutic measures in the treatment of circulatory disturbances, especially those associated with arterial hypertension. A number of pages are devoted to the description of the author's plan for carrying out the treatment by baths and therapy-exercise without leaving the confines of our metropolitan cities.

PRACTICAL OBSTETRICS. By Ernest Hastings Tweedy, F. R. C. P. I., Master of Rotunda Hospital, and G. T. Wrench, M. D., Late Assistant Master. Second Edition. New York: Oxford University Press. 1910. Price, \$5.50.

The rapid exhaustion of the first edition has evidently induced the authors to revise the book and eliminate a few errors which always seem unavoidable in a first edition. Many of the chapters have been re-written and new ones have been added. The views expressed on subjects like uterine inertia, treatment of contracted pelvis, and uterine rupture differ to some extent from those given in the first edition, in order to depict the most advanced thoughts on these topics. As a whole this little volume must be regarded one of the most satisfactory treatises dealing only with the practical aspects of obstetrics.

TEXTBOOK OF HYGIENE. By George H. Rohé, M. D., Late Professor of Therapeutics, Hygiene, and Mental Diseases in the College of Physicians and Surgeons, Baltimore, etc., and Albert Robin, M. D., Professor of Pathology, Bacteriology and Hygiene, Medical Department Temple University, and Philadelphia Dental College, etc. Fourth Revised Edition. Philadelphia: F. A. Davis Co. 1908.

This book has gone through several successful editions, and the present edition keeps up the standard which has already been set. Chapters on Personal Hygiene, Military Hygiene, Naval Hygiene, have been written by men with special training in these lines. Each chapter is followed by a series of questions which should be especially valuable to the student of medicine. There are a number of diagrams and tables which add to the usefulness of the book.

INTRODUCTION TO PRACTICAL CHEMISTRY. By A. M. Kellas, Ph. D., New York: Oxford University Press. 1909.

The author has attempted with much success to give a complete but concise laboratory manual for the use of the student of elementary chemistry. The first portion of the book is devoted to an explanation of chemical terms: the more common chemical phenomena with the technique and directions for preparing the typical compounds of the metals and the non-metallic elements. The second portion is a guide to the qualitative and quantitative analysis. Special effort is made to keep the various metallic groups separate in the student's mind, by dealing with each group and its various compounds separately.

ANATOMY AND PHYSIOLOGY FOR NURSES. By LeRoy Lewis, M. D. Second Edition. Philadelphia and London: W. B. Saunders Co., 1910. Price, \$1.75.

Anatomic and physiologic instruction are intermingled in the discussion of the various tissues and organs in a manner that may well prove peculiarly attractive to the readers for whom the book is designed. At the end of each chapter is a long list of questions, useful for quizzing on one side and for cramming on the other.

PATHOLOGISCHE PHYSIOLOGIE. LEHRBUCH FÜR STUDIERENDE UND ÄRZTE. Von Dr. Ludwig Krehl. Ord. Professor und Director der medizinischen Klinik in Heidelberg. Sechste Auflage. Leipzig: Verlag von F. C. W. Vogel. Preis: Mk. 15.

The enviable and wide-spread reputation which this excellent work has made for itself is the most adequate compliment it could receive. Every student of medical science, irrespective of the special field in which he may be laboring, will find the book both interesting and profitable reading. Viewing the subject of pathology not from the standpoint of the anatomist, but from that of the physiologist, and considering the deviation in function rather than in structure cannot help but appeal even to those of us who insist upon lending eye and ear to the acquiring of practical knowledge only. As in the other editions a carefully-selected bibliography, almost entirely of German publications, accompanies the text.

AN INDEX OF SYMPTOMS WITH DIAGNOSTIC METHODS. By Ralph Winnington Leftwich, M. D. Fourth Edition. New York: William Wood & Co. 1910. Price, \$2.25 net.

This handy little book has the merit of being written in the same logical order as that taken by the puzzled physician when, in an obscure case, he attempts to make a diagnosis by exclusion. Under the head of each symptom, the author has placed a list of the diseases in which the symptom may occur, indicating the most likely diseases by a star. The book will be most useful to the student and the recent graduate, but even the older practitioner may occasionally find it of value.

KLINISCHE BETRACHTUNGEN ÜBER SKROFULOSE. Von Dr. Paul Sittler. Wuerzburger Abhandlungen aus dem Gesamtgebiet der praktischen Medizin. Wuerzburg: Curt Kabitzsch (A. Stuber's Verlag). 1909. Price 85 Pf.

The writer discusses the pathology, symptomatology, diagnosis and treatment of scrofula, as found in children. He does not believe it to be primarily a tuberculous affection, but rather an independent disorder of the lymphatic system which involves a special predisposition to tuberculosis.

ESSENTIALS OF LABORATORY DIAGNOSIS, DESIGNED FOR STUDENTS AND PRACTITIONERS. By Francis Ashley Faught, M. D. Second Revised Edition. Philadelphia: F. A. Davis Co. 1910.

The first edition of this useful compilation was reviewed in these columns last year. The second edition contains a number of the newer tests, but is essentially a reproduction of the first. A useful feature not present in other text-books is a color scale for estimating the degree of indicanuria.

EDUCATION IN SEXUAL PHYSIOLOGY AND HYGIENE. A PHYSICIAN'S MESSAGE. By Philip Zenner, Professor of Neurology in the Medical Department of the University of Cincinnati. 16mo. Pages 128. Cincinnati: Robert Clarke Co. Price, \$1.00.

This book gives a number of very interesting talks which the author delivered to school children and college boys, and concludes with a discussion of the best methods of instruction in sexual matters.

ÜBER PANKREASERKRANKUNGEN. Von Dr. Wilhelm Hagen. Wuerzburger Abhandlungen aus dem Gesamtgebiet der praktischen Medizin. Wuerzburg: Curt Kabitzsch (A. Stuber's Verlag). 1909. Price 85 Pf.

A brief discussion of pancreatic cysts and of chronic and acute pancreatitis based upon the report of seven cases. The author is an advocate of the diagnostic importance of the Cammidge test.

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EDITORIAL.

HOW SHALL WE EDUCATE OUR EXCEPTIONAL CHILDREN?

The realization, that the exceptional child should receive a special education so that profit shall result, is receiving considerable attention in a number of countries to-day. Both educators and physicians are agreed that we have neglected our atypical children too long; and though the normal child must be looked after as heretofore, the unclassable youthful product of superior mental attainments should no longer be made the recipient of the multitudinous studies peculiar to a modern school curriculum, by the compulsory methods which always obtain when the normal child—the child of no special talent—is grounded in the studies, which the prevision of the educator of to-day deems necessary to “man in the making.” In short, we are beginning to realize that there are over-children in this world, to use a Nietzschean phrase, and that our treatment of them in the past has not been greatly to our credit. Just how the thought arose that the remissness in our attitude to the exceptional child ought not to be further abetted by the narrowness which characterizes the manner of teaching at the present time, would be an interesting chapter in educative evolution; and though our editorial judgment may be at fault in this matter, as it has repeatedly been in others, we are temerarious enough to advance that the paucity of genius, especially in this country, must have been a decided factor in awakening both medical men and educators to this special need of the hour.

The theory of education, which we take it has always been founded on the strangest idea that the human mind has ever evolved—namely, that all men are born equal, has been one of delightful and engaging

simplicity; for though it took into consideration how best to crowd each nook and cranny of the normal mind with all sorts and conditions of learning, it never bothered in a disquieting way about the great evil that is wrought by a system that induces receptivity and at the same time destructibility. To rid the normal mind of stubbles, so that into it may glide without let or hindrance those lessons which may have beneficial results, is a step towards building up the necessary receptiveness without which small profit accrues to the youthful mind. But when this is said, only normal mentality built on the most conventional lines is considered, and not the mental make-up whose best manifestations are cast in a distinctive groove. To oppose any other but the normal mind to the brunt of teaching, as driven home by the educator who knows his system only too well, makes not only for unreceptiveness, but causes a destruction of those outstanding qualities, which, were they properly nurtured, would eventually place the individual above his fellow-men. In a word, a mind of this calibre is laid waste by the approved educational process and may, when it recovers from the onslaughts, develop along those warped and objectionable lines which are not greatly desired—lines which are productive of talented but misguided individuals who revenge themselves on society for the great wrong done them by purblind educators.

Few, indeed, are the talented men who have written the story of their lives and have not told of the wrongs of the schoolroom. Their broodings over their shortcomings, their depressions due to their incapacity to learn, are a tragical page that must give the thoughtful reader pause. And the tragedies are always the same, since they arise from the same source—the lack of a mind, highly developed in one direction, to adapt itself to the multifarious studies with which the educator wishes to inundate it. When the stubborn front put up by a highly specialized mind is such, that it proves adamant to all those misdirected educative forces which are launched against it, there is no weakening, no disintegration of the one quality which distinguishes it; but when the talent or genius is not made of so stern a stuff, in short, has an Achilles heel, the dissipation of the prime mental quality is effected and the harm done is incalculable. And this is said, not because the writer of these lines wishes to convey the idea that talent and genius are necessarily undermined by education, but because in the curriculum of nearly all our schools scant attention is paid to the singling out of the exceptional student's most striking predilection, and the nurturing of it by the only sort of education which would strengthen it into a luxuriance of healthy growth. Hence, it has occurred to a small number of medical philosophers, and philosophers who know naught of medicine but a deal of education, that the times are

ripe to start special schools, in which more thought will be given to the subject of what constitutes the proper pabulum for a talent that should be nursed with care and solicitude.

What would be the object of these special schools? In the first place, they would segregate those who by nature are unfit for the educative system that mauls into obedience the lesser mental qualities of the decidedly normal; and, secondly, they would have instructors informed with the right spirit, so that the mistakes which to-day obtain would be obviated. To the superficial observer all this may seem Utopian, but that it has its iota of practicability must be apparent to him who sees deeper than the surface of things. If this were not so, why is it that the schools of to-day show so plentifully the results of the levelling processes of education, a drab monotony as the resultant of years of training, with only occasionally a mind in revolt above the level that is maintained with such religious zeal by the present-day educators? And just this untoward occurrence—a mind in revolt—will be done away with in the special schools, so that if nothing else is accomplished one charge at least cannot be laid at their doors—the charge that through misunderstanding of another the seeds were planted to increase the ranks of social and literary demagogism.

Our present school system, with its flaming dictum that all who enter shall reap the same benefits, may have its virtues, but it also has its drawbacks. What these are our society illustrates only too well. There, freedom of mental movement is not so striking a quality that it would arrest attention, for if we may say so, its hall-mark is the sort of conventionality that throttles the faintest aspirings after individuality. If there are any manifestations of talent that have not the trappings of eccentricity, a keener eye than ours would be required to ferret them out; but of the clear, lambent light of genius that always acts as the right leaven, the traces are indeed too indistinct to be detected. Therefore, is it fatuous for us to imagine that a school for geniuses, on the lines promulgated by Professor Stern of the University of Breslau, would be inopportune in these United States?

A CHAIR OF PREVENTIVE MEDICINE.

It is remarkable how slow the medical schools have been in keeping pace with the development of modern scientific medicine. Their failure to give proper recognition to preventive medicine in their curricula exemplifies this fact. Although the trend of scientific medicine is alto-

gether along the lines of prevention, there is only one medical school in the United States which has a chair of preventive medicine.

In this failure to keep pace with the progress of scientific medicine, our medical schools are neglecting their own interest as well as the interest of the medical profession. Scientific medicine will continue to develop along the lines of prevention, independent of medical schools, through the agency of governments, health-boards, and institutions which have been endowed for this purpose; and an enlightened public will more and more demand an application of all new knowledge obtained through these various agencies for its comfort and happiness. If the medical profession does not apply this new knowledge, agencies for its application will spring up out of the public demand for it. Already there is talk in educational circles about a new profession for the application of knowledge along the lines of prevention of disease. The training of men for the application of this knowledge, moreover, is to be given, not in medical schools, but in special departments of universities. This would be a serious loss to medical schools and to the medical profession alike.

Even as matters stand now, the medical profession is no longer a very enticing field of labor for the ambitious man. The chances of success in the profession from a material point of view, at least, have rapidly grown less within the last few years. For the man whose ambition it has been to become a general practitioner of medicine, the chief attraction in the profession has been the opportunity of making an honorable living. To have a comfortable home, to earn a fair amount of money, and to be well thought of in his own community, were his ambition, and in the past these were relatively easily obtained. Both in the city and the country, it is more difficult to attain them now than in the past, and it is becoming more difficult every day, and the reason is because the medical profession has not kept pace with the progress of scientific medicine and the demand made upon it by the public.

The general practitioner of medicine in order to be up-to-date should be able to disinfect houses; to test for adulteration of food; to give advice upon the building of sanitary houses, shops, stores, and out-buildings; to give opinions on sewage disposal, water supply, and heating; and to direct philanthropic work which has to do with preventive medicine. For all such services he ought to get commensurate compensation and prestige. In such services, general practitioners could undoubtedly find the prosperity which apparently has been lost. These services are now all given free by the government, and yet most people would prefer to pay for them. In the matter of disinfection of houses, for example, most people would prefer to have their houses disinfected by their family

physician, in whom they have the utmost confidence, and would be glad to pay a fair compensation for the service. A fee of from ten to twenty-five dollars would not be looked upon as a burden and would be profitable, both to the physician and the people.

What applies to the disinfection of houses, applies with equal force to the detection of adulteration in foods. People would often be glad to pay for expert services to protect themselves in the purchase of food, but as matters stand now, there is no market in which they can buy such service and they are compelled to depend upon the voluntary services of the government. The government is extending this kind of service more and more everyday and is thereby also extending its paternalism which in the end may become a most demoralizing influence on our free institutions.

In sanitation of houses, in water supply, and in disposal of sewage, people have no market at all in which they can purchase advice and have to depend entirely upon the voluntary services of the government. How much better it would be, if the family doctor could give advice on these subjects for a proper compensation.

Until our medical schools will wake up to the importance of giving to their graduates knowledge along all these various lines and training which will enable them to apply that knowledge, it will not be possible for the medical profession to exercise the functions and influence in our social body which scientific medicine has destined for it. The chair of preventive medicine should, at the present time, rank with the other important chairs in medical schools, for from it would issue those teachings which cannot but help to be illuminating lessons as to all the divers phases of sanitation.

OPINION AND CRITICISM.

FERMENTS.

The question of ferments is assuming an important rôle in medicine. Intangible and mystic as are the bodies or "powers" grouped under this name, the clearing up of their remarkable actions has been progressing steadily, from the earliest days of physiology through the stage of Pasteur's wonderful work, until the present time, as instanced by numerous medical journals repeatedly publishing articles giving clinical tests employing ferment-action. No actual ferment-body, so far as we know, has yet yielded its structural secret either to chemist or microscopist, and we must be content at present to recognize the group by certain group reactions. It is not necessary to dwell on the importance of the digestive enzymes for the proper digestion and absorption of food material, nor to mention with emphasis that the absence of ferment-action forms the basis of many pathological conditions. If medical men knew what prevented the presence of glycolytic ferment in diabetes, the secret of this as yet unsolved puzzle would not be difficult to find.

Recently many newer instances of this action have been carefully studied, none more interesting than the finding of a proteolytic enzyme in all tissues, which is increased in cancer-cells. The presence of a proteolytic enzyme in cancer-tissue has produced much investigation, resulting in the rather definite discovery that it cannot be differentiated from the trypsin of the pancreas, and that its action is antagonized by the antitryptic activity of blood-serum. For practical purposes in the diagnosis of cancer, it has been of very doubtful value until Neubauer and Fischer proposed to employ its presence as a practically definite sign of carcinoma ventriculæ. They reasoned that if cancer-cells produce a tryptic enzyme, such a ferment should be demonstrable in the gastric contents, and they devised an ingenious method of showing its presence. As is well known, proteolytic enzymes will split protein into amino-acids, and any protein may be employed to demonstrate the ferment. For practical purposes, some substance must be used whose cleavage-products can be recognized without difficulty, and for this reason Neubauer and Fischer proposed the dipeptide, "glycyltryptophan," a compound easily split into glycine and tryptophan. Tryptophan is demonstrated by simply adding a few drops of bromine water to the tube containing filtered gastric contents and the glycyltryptophan after it remained at body temperature for twenty-four hours. The presence of the split tryptophan—a positive reaction—is indicated by the solution taking a reddish-violet color.

The value of the test lies in the fact that the ferments of normal gastric contents are not capable of splitting protein as far down as the amino-acids, and researches at present indicate that such a ferment is present only in cancer. Sufficient work has not yet been done to permit any statement as to the time at which it first appears. In the practical carrying-out of the test, several difficulties are encountered. The original authors thought that the presence of blood, either macroscopical or occult, or of pancreatic juice, as indicated by a bile-stained fluid, rendered the test valueless, and before performing it they exclude these substances. Furthermore, a high content in hydrochloric acid inhibits the activity of the proteolytic ferment, but as in most cases of gastric carcinoma, the acidity of the stomach-juice is low. This objection is not very strong.

An interesting development of Neubauer and Fischer's work has just been completed by Weinstein, of New York. He found by parallel tests that the proteolytic ferment could be demonstrated as well without the addition of glycytryptophan, and further that the presence of small amounts of blood or of pancreatic juice did not offer practical objections to the test. By his method a sample of gastric juice taken four or five hours after a regular dinner (which should not contain colored food-stuffs, such as coffee, tomatoes, berries, etc.), is immediately tested for the presence of tryptophan by the addition of bromine water as in the original method.

Doubtful as must be the results of new methods until a large series of cases can be observed, this one gives great promise. In the present state of our knowledge, clinicians cannot expect any great help in the diagnosis of cancer of the stomach from the study of the gastric juice, as the findings are mere adjuvants, which, to be definite, must be grouped into a composite picture. Should this one new test come up to expectations, we will at last have a specific and undoubted test of considerable value.

Activity in the study of ferments has been especially noticeable in the attempt to diagnose pancreatic lesions. It seems to be generally accepted that the complicated Cammidge reaction has not been sufficiently specific to warrant employing it as a routine procedure; and investigators, especially amongst the Germans, have been busy with the study of the feces from the standpoint of the presence or absence of the starch-splitting and protein-splitting ferments of the pancreas. The proposed new tests are startlingly simple in application, but as yet rather more difficult of interpretation. If, however, continued study of these reactions will crystallize the hazy mixture into definite facts, the practitioner should have at his command several new and valuable diagnostic aids.

EVOLUTION OF MEDICAL TERMS.

It is axiomatic to state that the more profound our knowledge becomes the more confined are the uses of our words. When a generality is dissected into numerous parts, we must have terms to express the meaning of the divisions. Venereal diseases had to be separated into gonorrhea and syphilis; typhus fever into typhoid and typhus; and at the present day many of our class-names are being thrown from a position of specificity to one of obscurity. The *febricula* of diagnoses of not many years ago are coming into their own as influenzal, pneumococcal septicemias, through the influence of more careful bacteriological routine, or as one of a group like that described by Brill on the basis of most careful clinical observation. The white-cells of the blood form a whirl of polemic discussion based mainly on studies of histogenesis, and what is a myeloblast to-day becomes a lymphoblast to-morrow. Acute lymphatic leukemia is in grave danger of losing its respected position in the world of medical terminology, for after all, are not the large cells really myelogenous in origin? Raynaud's disease will probably ultimately be called by some other name, not as a concession to those who see no reason for attaching a man's name to things medical, but because as a clinico-pathological entity it will not be able to withstand the onslaughts of those who believe it to be merely a state of affairs existing at some particular time in the life of an unknown disease, whose ages at other periods are represented in erythromelalgia, acrocyanosis chronica anethetica, thrombo-angiitis obliterans, etc. Diabetes mellitus undoubtedly is a cloak to cover more than one disease whose main clinical manifestations are similar. Clinical observation has already divided this symptom-complex; further studies in conjunction with pathologists will surely make a more permanent classification when one begins to consider our present knowledge of diseases of the liver and spleen and remembers Hanot, Gaucher, Widal, Banti, in a confused medley with splenic anemia, hereditary acholuric jaundice, and hypertrophic cirrhosis. We can only hope for a future when definitions of diseases will be complete, and when the names applied will be based on clinico-pathological grounds rather than applied as an honor to the discoverer.

LITERARY NOTES.

Illustrative of the capacity of the human brain to store up a vast amount of knowledge and theories of all complexions is surely Otto Weininger's book, "Sex and Equality," which has recently been published by G. P. Putnam's Sons. To tell the reader all that this book contains would be

as wearying to the teller as to the listener. But even though the quantity is of such dimensions that one might call the book a complete history of a German mind imbued with all the modern teachings of German philosophers, the reader should persist in reading on, even though the turgid style be not to his taste, for by his perseverance he will not only understand the mind of Otto Weininger but also the mind of modern Germany. Now the mind of modern Germany is but little understood in this country, though we have had glimpses of it in the works of Schopenhauer and Nietzsche: instructive works, to be sure, but only understandable by him who has steeped his best thought in the quintessence of German philosophical tendencies. In Otto Weininger's book, on the other hand, we have the nakedness of a mind that hides nothing from public view, and inasmuch as it is an unusual one and is depicted in all its details by the author, the comprehension of all its peculiar phases is quite easy. Therefore, great is the gain to the reader, for at last he sees mirrored before him that complicated expression of modernity—the German philosophical mind. In his enthusiasm to direct the world's affairs the author shows all those tendencies, in the matter of exaggerating the faults of his opponents in reasoning, which invariably accompany enthusiasm when it is ably supported by an unquenchable *ego*. Of the theories which are put forth in each chapter, whether it is Chapter I. entitled "Males and Females," or Chapter IV. in which "Talent and Genius" are dissected, the one thing that can be said is that they are Otto Weininger's and no one else's; and admitting this as a virtue and not a defect, our attitude must be that of interested students ever on the alert for originality. If an objection to this remarkable work can be raised it is, that the author's *ego* at last overwhelms him, and, to so great an extent, that his clarity of the things as they must be, according to Nature, is greatly obscured. To denounce the sexual feeling as unholy and as an obstacle to the development of the human mind, even though the sexual thought has entered only in the relations between husband and wife, is carrying this vital matter into a spiritual atmosphere that cannot possibly encompass man.

In the Paris thesis which Dr. Raymond Durand wrote for his doctorate, he shows the responsibility of the rat in a number of diseases. As regards the bubonic plague, doubt no longer exists in the minds of investigators that the rat has the undesirable faculty of transferring the disease from port to port—thus openly declaring the nefariousness of its acts. Rats infected with the plague easily transfer the disease to the fleas which infest their bodies, and these in turn, when their hosts die, lose no time in finding other victims, and what more natural than that man should be selected for the continuance of the inoculations! Although the knowledge which we possess to-day, as to the connection be-

tween the diseases of the Muridæ and those of human beings and animals, is of recent date, from the earliest times suspicions were cast on the rat as the provocative agent in the propagation of the plague. The most ancient document relative to this point is to be found in the Bible, for there we read à propos of the epidemic which decimated the Philistines: *Et ebullierunt villæ et agri * * * et nati sunt mures et facta est confusio mortis magnæ in civitate*. Nicolas Poussin in his painting, "The Plague of the Philistines," shows a number of dead rats near the plague-stricken; hence the inference cannot be aught but that the Hebrews were well aware that the visitations of the plague were either preceded or accompanied by an excessive mortality of rats. The Egyptians symbolized the plague by representations of the rat. At Thebes, in the temple of Ptah, the deity of destruction held a rat in his hand. Again, in the Old Testament, we read that the Destroying Angel killed in one night 185,000 soldiers belonging to Sennacherib's army, but the Egyptian tradition differs from this; and, what with our modern belief in the efficacy of the rat as a transmitter of bacilli, we must perforce look askance at the Biblical version even though our faith in Avenging and Destroying Angels will be annihilated. According to Egyptian lore it was the deity Ptah who, hearing that the Assyrians had invaded Egypt, drove them back to Nineveh with considerable loss of life, by turning loose a swarm of rats which invaded their camps. The participation of rats in the diffusion of the plague is mentioned in the memoirs of Ichangir-Schangir, emperor of India, relative to the epidemic at Agra in 1618, the origin of which was traced to a dead rat that had been brought to the Indian port from plague-stricken Hankow, where the epidemic had raged during the years 1611-1618. In the province of Yunnan in China a popular belief obtains to-day that the plague should go by no other name than that of "Rat Disease."

ORIGINAL ARTICLES.

ON SPONDYLITIS TYPHOSA (TYPHOID SPINE) WITH REPORT OF THREE CASES.

By ANDERS FRICK, M. D., of Chicago,
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The following three cases of spondylitis typhosa have come under my observation:—

1. A. K., a grocer, aged thirty-one years, contracted typhoid fever in the early part of November, 1905. The Widal reaction was positive, rose-spots were present. The fever ran its ordinary course with no complications and the temperature became normal December 9th. On December 22nd he got out of bed and on January 22nd, 1906, he went to work feeling well. On January 29th, the eighty-second day after the onset of fever, upon arising in the morning, he felt such a severe pain in the stomach that he had to return to bed and could thereafter hardly move at all without experiencing intense pains. When I saw him a few hours later, the pains were localized not so much to the stomach as to the back and both sides, and the slightest attempt of turning on his side caused the most excruciating pains in the back. The temperature was 99.6° F. and the pulse 108. Two days later, the temperature had risen to 103° F., with a pulse of 120, and there was a distinct tenderness to the right of the twelfth dorsal spinal process. The urine contained a trace of albumin but was otherwise normal. Afterwards the temperature remained febrile, the pulse rapid, and the pains in the back and around the sides, as well as the tenderness, remained unchanged. On February 7th, another symptom appeared, viz., rhythmical contractions of the abdomen which were synchronous with the pulse. The entire abdomen shook and was retracted with every pulse-beat, but when I pressed my hand forcibly against the aorta in the epigastrium the contractions ceased below the point of pressure. The phenomenon stopped for the time being after a hypodermic injection of $\frac{1}{6}$ gr. of morphine and was absent while the patient was asleep. It kept on every day for a week and thereafter gradually disappeared.

By this time, February 14th, a marked rigidity of the upper part of the right m. rectus abdominis was noticed but there was no tenderness to speak of at any point of the abdomen; the rigidity disappeared after four

or five days. Otherwise, his condition remained unchanged until February 22nd; he complained bitterly of pains in the back and sides, especially upon sneezing and coughing; the fever was moderately high. On February 22nd, the temperature rose in the afternoon to 103° F., there were 17,400 leucocytes in a cubic millimetre of blood. At 6 o'clock p. m. he was given 7½ gr. of phenacetin. At 10 o'clock p. m. the same day the temperature was 99° F. and from that moment the temperature practically remained normal and he improved rapidly. On April 26th, he was feeling quite well but could still feel some pains in the back and there was some tenderness to the right of the twelfth dorsal and the upper lumbar spinal processes. These symptoms disappeared shortly afterwards.

2. A. A. of Oregon, Ill., a boy, aged eighteen, working in a piano factory, contracted typhoid fever in September, 1908. After three weeks, the temperature became normal and, after three weeks more, he began to sit up in a chair, by October 25th. During the last few days before the temperature became normal, he had begun to feel some slight pains in his back off and on, but nevertheless he was getting along fairly well, could move about without difficulty, and was gaining in weight. On December 3rd, after having been exposed to wet and cold, he suddenly got worse, had so severe pains in the lower part of the back that he could not move in the bed and the temperature rose to 102° F. For a week the temperature was febrile, and ten days later, or December 13th, I was called to see him. He was then slightly better, the temperature was normal but he still had severe pains in the back when trying to move. He could walk, but only with great difficulty and managed then to keep the entire pelvis from moving at all. When he was to put the left foot forward, he rested on the right foot and made the entire left side of his body swing forward so as to avoid any motion in the pelvic joints; and vice versa when he was to put the right foot forward. Stooping was almost impossible for him and any attempt caused severe pains in his back. There was a very marked tenderness on pressure over the fifth lumbar vertebra, but no edema, and even a slight rap on the top of his head produced a pain at this same place.

The patellar reflexes were increased and foot-clonus was present. Neither Babinski's nor Kernig's sign was present and there was no incontinence of rectum or bladder and no paralysis of sensory or motory nerves. I advised him to lie perfectly quiet on his back without making any effort himself to move and to keep hot salt-bags under the lumbar and sacral regions of his back. His father wrote me in March, 1909, that the pains had disappeared almost entirely after a week and that, after three weeks, he had begun to be up and had thereafter rapidly improved. At the time of his writing the boy was practically well, only a slight stiffness of the back remaining.

3. N. N. B., a moulder, aged forty-six years, whom I saw with Dr. Lenz, contracted typhoid fever in January, 1909, had a relapse in February and, after quite a severe course, the fever finally left him March 6th. Nine days later, on March 15th, he got a very severe pain in the left dorso-lumbar region and at the same time a chill that lasted half an hour, and which was followed by fever and perspiration; the temperature rose to 103° . During the following week he had four or five severe chills followed by a rise of the temperature and by sweating. On March 22nd I saw him. He was then still complaining of the same pain in the back, radiating around the left side of his body along the costal margin and down both legs, particularly the left one. The pains were greatly increased by movements and it was only with great difficulty he could turn or sit up in bed. On examination nothing abnormal could be found except a very pronounced hyperesthesia of the area where the pains were located, *i. e.*, from the posterior middle line at the level of the eleventh and twelfth dorsal and the first lumbar vertebræ around his left side parallel with the ribs to the anterior middle line. All reflexes were normal except that the knee-jerks were somewhat slow. The urine was normal. He was advised to lie perfectly quiet on his back without making any effort himself to move, and to keep hot water-bags to the painful parts. I am told that afterwards he had no more chills, that the fever kept on for several weeks, that he gradually improved, and that he resumed work in the early part of June, 1909.

In order to give a more comprehensive view of this subject, a few other cases selected from the literature may be mentioned:—

Le Breton reports one case of a patient who had typhoid in September, 1905, and afterwards noticed some pains, stiffness and tenderness in back which did not become severe until one day in January, 1906, when he slipped and wrenched his back. He was kept in bed with weight and pulley extension to each leg for two weeks, when a stiff leather jacket was put on. After six months he was well.

Another patient of Le Breton's had typhoid fever in November, 1905. When he began to sit up he noticed pains and lameness in the lower part of his back, but not until three months later, after exposure to cold weather, did he have any acute pains. His back was then straight, no lumbar lordosis, no tenderness over back, but pressure on abdomen increased the pains. Leather-jacket was put on and he gradually got well.

Gibney reports the case of a patient who had typhoid fever in 1903 and who, in 1904 fell from a hammock. There was no immediate effect but later on she began to have pain in the back and in 1906 she had a boss involving the eleventh and twelfth dorsal and the first lumbar vertebræ. She got relief by a posterior spinal assistant.

Another patient of Gibney's had typhoid fever in July, 1905. When he began to be up, he complained of an occasional pain in the back but paid no attention to it. In September, 1905, he made a misstep and felt

a sharp pain in the right side of the lumbar region which pain later came back more and more frequently. In December, 1905, he had very severe pains and every attempt at moving or examining him seemed to bring on terror. Two weeks later, the temperature rose to 103° and remained febrile for three days. The only objective sign was a point of tenderness over the lateral masses of the first and second lumbar vertebrae on the right side. He got well under the treatment Gibney advocates; fixation of the spinal column, in this case by a Knight's spinal brace, and the use of Paquelin.

A third patient of Gibney's had typhoid fever in October, 1898. During the convalescence, his back began to give him trouble and he tried all kinds of baths without deriving any benefit. In March, 1899, he stooped like an old man and leaned to the left side. The least jar or sudden movement caused him pains and he had to grasp his thighs at times to steady himself. There was no marked spinal tenderness. He got immediate relief from the treatment and in May, 1899, he was well enough to play golf.

Love reports one case of typhoid fever in which the temperature became normal on the thirty-sixth day and, on the forty-ninth, the patient got severe pains in the back, right iliac fossa, and right leg. There were ankle-clonus and increased patellar reflexes. He got well in three months.

Another patient of Love's had normal temperature on the twenty-eighth day and, on the forty-eighth day, got severe pains in the back and had great difficulty to turn. He had no fever. Sensation was normal. He had ankle-clonus and increased patellar reflexes. He was dismissed after half a year with some stiffness still remaining.

Quinke reported two cases in 1898. In one, the patient, on the fifty-first day, got severe pains in the lumbar and sacral regions with high fever which lasted two weeks. There were some local tenderness and swelling, pains when column was compressed, and pronounced spinal symptoms, viz., trouble from rectum and bladder, extreme weakness and paresthesia of the lower extremities, absence of knee-jerks for a long time. He was fairly well two months later.

In the second case of Quinke's, the symptoms of typhoid spondylitis set in ten weeks after the temperature had become normal, with pains and stiffness in back, a fever of 39° C., tenderness over the lower lumbar and upper sacral spinal processes, and pains also in anterior part of thighs. The fever lasted two weeks. He was well four months later.

Ely describes a case in which the pains were so severe that it was found necessary to give chloroform when the patient was to be put on the bed-pan.

Wirt reports a few cases, one of a physician who, immediately after the temperature had become normal, got pains and rigidity of the back and rise of temperature. He wore a plaster-jacket for half a year.

Another patient of Wirt's had typhoid fever in July, 1898, and was

again at work in the autumn of 1898. In November, one day he stooped to pick up a bag of grain, when he got a severe pain in the back, fell to the floor and could not walk on account of pains. Rigidity of the back was noticed and a prominence of the lower dorsal and upper lumbar vertebræ. He gradually got better, could walk about with a corset in April, 1899, but was not well until one and a half years later.

Osler reports the following case amongst others: A patient, aged thirty-two, when convalescent after a relapse of typhoid fever, had sat up on October 4th. On October 6th, he began to complain of pain in the back of his neck, particularly in the upper part. The patient could not turn his head from side to side. There was no swelling and nothing could be felt on examining the cervical vertebræ from the pharynx. Subsequently the soreness extended to the back and down the hips. He held himself very erect and walked stiffly. He said he was most comfortable while up and moving about. There were no tender points. The free application of the Paquelin gave great relief, and at the date of his discharge, October 21st, he was much improved.

McCrae reports a case of typhoid spine in a patient who showed rhythmic contractions of the abdominal muscles at the rate of seventy-five a minute. They were faster than, and not synchronous with, the pulse and stopped when he was asleep.

The same author reports a few more cases: One in which the patient experienced a sudden pain in the back three months after having recovered from typhoid fever. The pains were so severe that he could hardly be moved and could scarcely be touched. He got well in three months.

Another patient of McCrae's was convalescing from typhoid fever in March, 1904. One night he wakened with a very severe pain in the back. Since then he was stiff and had an almost constant pain in the lower part of the back and down the thighs. In July, 1904, he had a relapse of the typhoid and the fever lasted nineteen days. Thereafter, he improved gradually and was perfectly well in October the same year, except that he could not bend over with the same ease as before. An *x*-ray picture showed on the right side, between the second and the third lumbar vertebræ, a definite deposit of bone filling out the intervertebral space, apparently in the latter ligament, forming a bony union between the two vertebræ.

Another patient of the same author's contracted typhoid fever in October, 1905. The temperature became normal November 14th, and November 28th he had pains in his back when he sat up, and the back was rigid. There were no objective signs, no tenderness at this time. On December 6th, an *x*-ray picture showed a deposit of new bone on both sides between the fourth and fifth lumbar vertebræ; the intervertebral region seemed entirely filled out on both sides of the spine. The deposit of bone seemed to involve both the intervertebral disc and the lateral liga-

ments. On December 12th, the temperature rose to 100° F. and the fever continued for five weeks. On December 23rd, some atrophy in the legs was noticed. Gradually a definite area of tenderness to the left between the fourth and fifth lumbar vertebræ appeared by January 31st. A double scoliosis developed. On January 9th, 1906, a marked atrophy of the right leg was noticed and he was so weak that he could hardly stand. A plaster-cast was put on, and thereafter he improved rapidly. The Widal reaction was negative in this case and a paracolon bacillus was found in blood-cultures. On May 1st, 1906, he was perfectly well, was working hard and only a slight stiffness in the lower part of the back remained.

Wilson reports the case of a patient who had typhoid fever from September 12th to October 8th, 1902. November 20th, 1902, he got a pain in his back which gradually grew worse. December 11th he got a chill and the temperature rose to 102° F. He grew worse until January 28th, 1903, when he suddenly began to improve after a dose of 5 gr. of aspirin. A gibbus of the second and third lumbar vertebræ developed and a radiogram showed some weakness of the shadow of the second lumbar vertebræ; the gibbus remained. He used crutches until October, 1904, and a jacket until August, 1905. He was well in May, 1906.

Silver describes a case of a boy, aged eighteen, whom he saw six weeks after the onset of symptoms of typhoid spine. A radiogram showed the first and second lumbar vertebræ affected. The space between them was absent; the shadow was of increased density. In this case, the first lumbar spinal process was prominent and Silver considered it due to partial destruction of the disc and not to softening of the vertebral bodies.

Conner reports the case of a patient who, on the 23rd day of typhoid fever, got severe lancinating pains in the lumbar region, particularly when moving. The temperature rose to 103°, the leucocytes increased from 11,800 to 14,400 and 17,600, with 84 per cent. polynuclear cells. An x-ray picture showed a filling out of the intervertebral space between the fourth and fifth lumbar vertebræ. He improved slowly and was somewhat stiff half a year later.

Myers reports the case of a patient who, in the third or fourth week of typhoid fever, got severe spinal pains. Two months later, a plaster jacket was applied under suspension. Abrasions formed under the jacket, and it had to be removed about twice a week to dress these. This caused so much pain that he had to receive an anesthetic each time it was done. A kyphosis existed over the first, second, and third lumbar spines; tenderness over deformity. A skiagram showed a synostosis between the second and third lumbar vertebræ. Myers comes to the conclusion that, in order to avoid complications from lungs and pleura, these cases should be protected by a brace, which will not compress the chest, rather than by a jacket.

Packard, who has reported five cases, says in conclusion: "Probably

the diseases that are most likely to be mistaken for typhoid spine are neurasthenia, tubercular spine, and lumbago. The latter can generally be excluded, from the fact that it is transient and apt to recur. It has not been my experience to see the immediate relief from fixative appliances that I have observed in tubercular cases; in fact, the first effects seem discouraging and, in some instances, it seems to aggravate the symptoms, but in nearly all cases within a few weeks the relief is pronounced. The peculiar condition, during the early mechanical treatment, I feel is indicative of the absence of tuberculosis, and when good motility returns after a few months of mechanical treatment (as it frequently does) it is further evidence of a non-tubercular condition. There is nothing so unsatisfactory in my experience as trying to relieve neurotic symptoms by fixation. Even if we obtain temporary relief, relapse is certain in a short time. The pronounced relief from fixation in typhoid spine and the absence of recurring symptoms present the strongest possible evidence, in my mind, that this group of symptoms known as typhoid spine is not a neurosis."

Ogilvy describes an interesting case: A man of fifty-six had typhoid fever complicated by double pneumonia. A few weeks after being discharged from hospital, he began to complain of stiffness in back. The pain grew more severe with acute exacerbations which made it necessary to administer morphine. Finally, any motion, even the raising of an arm from the bed, would cause a painful spasm. Massage and active and passive motion were advised but resulted in accentuation of the symptoms. Steam-baths were given but resulted only in depressing and weakening the patient. Cautey was used with slight, temporary relief. Adhesive-plaster strapping was followed with better results. Finally, after more than four months of constant suffering, which had made him extremely nervous, a plaster-of-Paris bed was applied, including also thighs, neck and shoulders, and retained in place by a plaster-of-Paris bandage below and a muslin bandage above the thorax. Thereafter, there was none of the severe attacks of pain previously noted, and the patient gradually recovered.

Mueller reports a case of typhoid spondylitis which is remarkable because of the slow development of the symptoms, because of the localization to the upper dorsal vertebræ, of the absence of fever, and of the marked involvement of the medulla.

History.—The first analysis of cases of typhoid spondylitis was made by Lord in 1902 who found 26 cases reported. Fluss, in 1905, was able to gather 42 cases from the literature, while an analysis published by Silver in 1907 includes 67 reported cases, out of which 14 were excluded for different reasons. A fairly complete bibliography up to October, 1907, is to be found in Silver's article, which, however, omits a few cases reported before 1907. Halpenny, in a report read before the Medical Congress in Budapest, 1909, was able to bring the total of reported cases up to 72.

In addition to these, however, there are 2 cases reported by Le Breton in 1907, and one by Potter in 1910. Two more articles on this subject have been published in 1908, one by Berry and one by Giacomo; neither has been at my disposal. Including the 3 cases here reported, we find that about 80 cases of typhoid spine have been described since Gibney reported the first case in 1889.

The clinical material is therefore sufficiently abundant to give us a fairly definite picture of this complication of typhoid fever.

Etiology.—The first symptoms appear at times during the latter part of the febrile stage, but usually during convalescence and often as late as three or four months after the temperature has become normal. It is exceptional that they appear more than a year afterwards, as in one case of Gibney's, but this is nevertheless in harmony with what we know of the longevity of the typhoid bacillus in other tissues, in gall-bladder, in intestines, in urinary organs, in bone-abscesses.

In most of the cases, no immediate cause of the first symptoms is apparent, but not infrequently (37 per cent., according to Silver), a trauma, a fall, a misstep, a sudden effort, a wrenching of the back, seems to be the cause, and in a few cases (Le Breton, one of my own) exposure to wet and cold precedes the appearance of the characteristic symptoms.

Symptomatology.—The first symptom is practically always a more or less severe pain in the back. Exceptions exist, as in one of my own cases where the initial pain was referred to the abdomen. The pain may come on slowly and gradually grow more severe or may reach its maximum of intensity within a few hours. At other times it is moderately severe at first, and later on, after a trauma or exposure, it suddenly becomes very severe. The character of the pain is a constant ache which is greatly exaggerated often by even the slightest movement, by a cough, by a sneeze. The localization of the pain is usually in the lumbar region, but sometimes in the dorsal or sacral region. Only 2 cases have been described where the pain was referred to the cervical part of the spine, viz., one case of Osler's and one of Gibney's. The latter one, however, is somewhat doubtful; it concerned a forty-five-year old Tyrolese who had had typhoid fever when he was twenty-two and who, a few days after convalescence, got severe pains in forehead and in top of his head, gradually extending toward the back of his neck; it took two years before he considered himself well, and a torticollis remained.

The symptom next in importance to the pain is elevation of the temperature. In all of my own 3 cases, fever was present from the time the pain became severe, and it seems that in most of the cases reported, which have been closely observed from the onset, a rise of temperature has been noticed. Still, in one of Love's cases, it is explicitly stated that no fever was present. The fever is often as high as 103° F. and chills are often mentioned as being present. The fever lasts from a few days to several weeks, is of an irregular type and seems to be somewhat dependent on the treatment.

The general condition of the patient during the course of the disease is comparatively good, particularly if he is put under proper treatment. It has been generally considered that neurotic symptoms are very common in cases of typhoid spondylitis, but, I may say, I have been unable to find any corroboration of this statement in clinical facts. It is true that the patient frets and wails and complains, but who would not do the same if for weeks and months the slightest movement caused a most excruciating pain? I have not found anything unreasonable in their complaints but, on the contrary, I am inclined to believe that the continuance of their complaints is due less to their own neurotic condition than to lack of recognition upon the physician's part of the real nature of the illness. I do not doubt, however, that neurotic symptoms may occur in cases of typhoid spine, as in any kind of disease, if the patient gives himself up to self-observation, worry and fear. Under those circumstances, he will naturally exaggerate the symptoms due to the anatomical lesion and probably find new ones which are independent of the changes in the spine. But these symptoms, should they occur, are to be considered as a complicating feature and by no means as characteristic of typhoid spondylitis. A correct diagnosis will differentiate between the symptoms due to the anatomical lesion and the truly neurotic ones, and, when the former are alleviated by proper treatment and the prognosis is made clear to the patient, he will surely take a more hopeful view and be able to disregard the latter.

The local symptoms of the typhoid spondylitis are of two kinds: those which are due directly to the pathological process in the vertebræ and those due to pressure on the nerve-roots and the spinal cord.

The symptoms due directly to the pathological process are tenderness, rigidity of the spine, swelling, redness, kyphosis, and scoliosis. Tenderness is elicited by direct pressure on the spinal process (in 29 cases out of 53 according to Silver), or at the side of the process, or by compression of the spinal column. Swelling is a less constant symptom than tenderness, and redness of the affected region is very rare, only in 3 cases out of 53 according to Silver. Kyphosis was noticed in 15 and scoliosis in 7 out of 53 cases, according to the same author.

The symptoms due to pressure on nerve-roots, cord, or cauda—according to what part of the spine and what part of the vertebra is affected—are almost always of the irritative type: referred pains, hyperesthesia, paresthesia, rhythmic contractions, spasticity. The following referred pains have been described: Girdle sensation, pains in one or both sides, in abdomen, in testicle, in hips and thighs, in legs. No satisfactory explanation of the rhythmic contractions which were observed in a few cases has been given. Pressure symptoms of the inhibitory type occur also but are very rare. Anesthesia was found only in one case, incontinence only in two. In one of the cases reported by Quincke, there were both disturbances of rectum and bladder and paresis of both legs.

Reaction of degeneration was noted in one case. Ataxia is said to have been present in one case. The reflexes from the lower extremities are often increased, the ankle-clonus is sometimes present, but only in very few cases has a decrease or absence of the knee-jerks been noticed. Babinski's sign has never been present in these cases and Kermig's sign only in three, according to Silver.

The duration of this complication of typhoid fever varies from about a month to two years or more.

Prognosis.—Practically all cases reported have recovered, most of them completely, even if such marked symptoms as scoliosis were present. In a few cases, some stiffness or soreness or lameness at times or discomfort on coughing has remained. Schaffer, however, has reported a case of probable typhoid spine which ended fatally. Soon after the convalescence after typhoid fever, the patient fell on the ice. The fall was followed by acute spinal symptoms and high fever. He could be moved in bed only with the greatest difficulty. After much suffering he finally died. The autopsy showed a considerable periostitis of the dorsal spine and an obscure lesion of the spinal cord.

Pathology.—As regards the pathological changes in these cases, there has not been any complete report of an autopsy in a case of typhoid spondylitis as yet, and we must, therefore, be satisfied to draw our conclusions as to the pathology from the clinical symptoms and from what we know of typhoid bone lesions in general.

That a definite organic lesion is present, seems to be reasonably certain; the presence of fever, the disturbed sensation in the distribution of the spinal nerves, the x-ray findings, the kyphosis, all speak in favor of an organic lesion. It is true, however, that these symptoms do not occur in all cases; but the presence of one or more of them in the great majority of cases seems to me to force us to accept as most probable that some organic lesion exists also in those mild cases where practically no objective findings have been noted.

Osler seems to have been vigorously opposed to the conception of the syndrome of typhoid spine being due to an organic lesion. In 1894 he published an article entitled: "On the neurosis following enteric fever known as typhoid spine," basing his opinion on the fact that "the most careful examination of the spine fails to reveal any signs of organic disease." He seems later to have receded somewhat from the position taken at that time, but still insists in one of the latest editions of his "Principles and Practice of Medicine" that "usually the condition is a neurosis." However, in one of the cases reported by Osler psychotherapeutic methods were used, the patient was encouraged to believe that he had no serious organic trouble, but apparently with no effect.

Most authors on this subject agree that a definite organic lesion is present. Quincke, in describing one case with local swelling, pain on compression of the column, and with pronounced symptoms from the

spinal cord, points out that the latter could be explained as due to a leptomeningitis but not the former, while a swelling of the periosteum on both the inner and outer surfaces of the vertebræ would explain both. Gibney, in reporting the first four cases, expresses also the opinion that the lesion is a perispondylitis, and it was only because the name spondylitis might evoke the idea of osseous tuberculosis, that he preferred to create the name "typhoid spine." Love suggests that there may exist an inflammatory condition of the nerve-sheaths in the vertebral canal but does not produce any proofs for his contention. Winokurow reports two cases of "Steifheit der Wirbelsäule" occurring during convalescence after typhoid fever, and makes the categorical statement that the stiffness of the spinal column is a symptom of leptomeningitis.

To decide exactly what part of the vertebra is affected, seems to be impossible as yet. However, it appears that we may assume from the reports on hand that at times the corpus and at other times the arcus vertebræ is affected. A local swelling and a direct tenderness, with absence of kyphosis and absence of pain on compression of the column, would make a spondylitis posterior most probable. A spondylitis anterior might be diagnosed if kyphosis and pain on compression of the column are present. In case destruction of bone or proliferation of bony tissue has taken place, a radiogram will be very helpful to locate the lesion.

The pathological processes do not seem to lead to formation of pus, at least no clear case of typhoid spine has been reported where pus was found. However, Raymond and Sicard in 1905 reported a case of what they called *épidurite purulente lombaire à bacille d'Eberth*, which may have been a case of suppurative typhoid spondylitis. It concerned a patient of forty-eight years who had typhoid fever in January, 1905; the Widal reaction was positive. During convalescence in March, 1905, the patient got severe pains in the right hypochondrium, in the right iliac fossa, which was *empâtée*, and in the right leg. Gradually this leg was paralyzed. Thereafter, he got pains in the left leg which was also gradually paralyzed. In May, 1905, he had complete paraplegia and suffered from attacks of very severe pains. Gradually, an atrophy with reaction of degeneration developed in the muscles supplied by the crural nerve. Reflexes were absent. There was at times hypo- and at times hyperesthesia. The temperature was irregular, varying between 37° and 38.5° C. An attempt to make a lumbar puncture gave the result that pus was found in the epidural space. Typhoid bacilli were found in the pus. Laminectomy was performed on the third and fourth vertebræ and about half a teaspoonful of pus removed. No bone-lesion was found. The cerebro-spinal fluid was clear and contained no cells. The wound healed promptly and all symptoms disappeared. The explanation of this case was considered dubious. Either a direct infection of the epidural fatty tissue from the blood had taken place, or a spondylitis existed which had been overlooked, or a propagation of the infection had occurred from the

right iliac fossa to the epidural tissue. The theory of an overlooked spondylitis appears to me to be the most plausible explanation.

Another case was reported by Morian in 1893 in which typhoid fever was followed by a suppurative spondylitis. It concerned a boy of seventeen years, who had had typhoid fever two years previously, when he suddenly got sick January 6th, 1893, with pain and tenderness over the eleventh and twelfth dorsal vertebræ. An incision was made January 23rd, pus was found which contained a pure culture of staphylococcus aureus and there was naked bone on the arch of the twelfth dorsal vertebra. Consequently the case seems to have been one of ordinary infectious osteomyelitis which had no direct etiological connection with the previous typhoid fever.

Another case, reported by Guyot in 1906, has been mentioned in the literature by Silver and others as being one of typhoid spine resulting in pus formation. It concerned a child who for a week had had an evening temperature of 39° to 40° C. and "showed the symptoms of typhoid fever." On examination a pronounced tenderness was found over the lumbo-sacral vertebræ without any swelling or fluctuation. An incision was made and a large amount of pus was removed but no bone-lesion was found. Two days later, an osteomyelitis appeared in the left fibula and shortly afterwards another in the right thumb. No bacteriological examination was made but we may conclude that the case was one of ordinary infectious osteomyelitis from the fact that the child did not have typhoid fever. Guyot himself does not seem to consider the case as one due to typhoid infection as he calls it *ostéomyélite vertébrale à forme typhoïde*.

In regard to bone-lesions in general occurring in typhoid fever, we know that typhoid bacilli practically always are present in the bone-marrow during typhoid fever (Fraenkel, Quincke, Ebermaier, Busch, and others) and in especially large numbers in the vertebræ (Fraenkel). We know that, probably in all cases of typhoid fever, changes take place in the bone-marrow throughout the system, although they do not produce clinical symptoms. These changes consist in microscopical foci of necrosis and in an increase of blood-forming cells (Longcope, Manuel), and resemble those occurring in the lymphatic tissue. We know furthermore that under certain favorable conditions (a trauma is considered to be one predisposing cause) the typhoid bacilli will cause more extensive lesions in the bones.

According to Ponfick, the periosteum becomes swollen and gelatinous, the surface of the bones becomes uneven on account of erosions and, later on, of hyperostosis, *i. e.*, of first destructive and then regenerative processes. Klemm (ref. Hoedlemoser) distinguished on the one side specific typhoid inflammations of the bones, *viz.*, a cortical osteomyelitis, with tendency to spontaneous resorption or caseation or liquefaction, or a central osteomyelitis resulting in the formation of a sequestrum; and on the

other side pus formation, as in ordinary infectious osteomyelitis. Klemm insists that the typhoid bone-lesion should be called osteomyelitis non purulenta because the exudate, if present, does not resemble ordinary pus but is a reddish-yellow, thin fluid. Only in case of mixed infection is the exudate a thick yellow pus, according to Klemm. Other authors, however, have experimentally by inoculation of typhoid bacilli produced yellow pus similar to pus obtained by infection with ordinary pus bacteria (Dmochowski and Janowski).

The bone-lesions in typhoid fever usually appear during the convalescence. Out of 103 cases gathered by Klemm from Quincke's Clinic, only 18 started during the febrile period. In these 103 cases, there were multiple bone-lesions in 38, and 87 of these bone-lesions suppurated while not less than 67 healed without suppurating.

In regard to the further course of the bone-lesions in typhoid fever, Dupont (ref. Høedlemoser) makes a distinction between an acute form which goes to resorption or to pus formation and a chronic form which results either in pus or in exostosis, which may remain unchanged for a long time and may closely resemble a syphilitic exostosis. However, it is probably impossible to make a distinction between acute and chronic cases, as a protracted course is characteristic for all typhoid bone-lesions. Paul-Boncourt adds a third form which he calls the rheumatic form, characterized by rheumatic pains and a rapid growth of the bones and the appearance of striæ in the skin.

The ultimate result of the typhoid bone-lesions is practically always recovery. Only one case of death has been reported (Klemm) but there was a mixed infection, both typhoid bacilli and bacterium coli having been found in the pus.

If we now compare the clinical picture of the typhoid spondylitis with what we know of other typhoidal bone-lesions, we cannot but find the greatest analogy between them. The onset and course, particularly, are very similar, in fact the only discrepancy between them is that pus formation is extremely rare in the typhoid spondylitis, if it occurs at all, but is of common occurrence in the other typhoidal bone-lesions. However, this discrepancy means, of course, only a difference in the degree of the inflammatory processes and may depend upon difference in structure between the vertebræ and the long bones of the body. This explanation becomes more plausible when we find that cases have been reported in which such eminently pyogenic bacteria as the pneumococcus and the streptococcus apparently have been the cause of non-suppurating spondylitis. Quincke has namely reported the following two cases: A man of forty-six had empyema in October, 1901, and, after the resection of a rib, got well. He began to work in January, 1902, but five days later got a severe pain in the lumbar region with tenderness of the third lumbar spinal process and a swelling in the left lumbar region which was not tender and did not contain pus. A plaster-cast was put on and in March,

1902, the man was well. As streptococci had been found in the pus from the empyema, Quinke concluded that the vertebral lesion was a streptococcus spondylitis. The other case was the one of a man of forty-six who had recovered from pneumonia and begun to work October 24th, 1902. Four days later he awakened at night with a severe pain in his back. November 21st, when he was admitted to the clinic, it was found that the second and third lumbar spinal processes were prominent and tender and that compression of the spine caused pains at the same place. Extension was used and the man was well in May, 1903. No pus was found. Quinke considered the case to be one of pneumococcus spondylitis.

In conclusion we may say that from the clinical manifestations of typhoid spine, as well as from the analogy with the well-known typhoidal bone-lesions, we are justified to assume that the syndrome of typhoid spine is due to a definite lesion of one or more vertebræ—to a spondylitis.

Diagnosis.—The diagnosis of typhoid spine does not seem to offer any particular difficulties if one only keeps in mind the possibility of this complication. The usually acute onset during the decline of or the convalescence after typhoid fever, the characteristic pain, the local tenderness on direct pressure or on compression of the spine, and the objective symptoms due to pressure on nerve-roots and on cord, generally suffice to make the diagnosis certain; and of course it gains additional strength in case there is present a local swelling or gibbus, or if, by means of a radiogram, a bone-lesion can be demonstrated.

Other affections which should be thought of, but which, on close examination, ought to be easily differentiated from a spondylitis, are a general neurosis, a neuralgia—as intercostal neuralgia, lumbago, sciatica, a psoas abscess, an acute infection of the kidney, an infarct or abscess of the spleen, a gastric ulcer, cholelithiasis, different affections of the spinal cord.

After a diagnosis of a spinal lesion has been made, it should, of course, also be ascertained whether or no it is due to a typhoid infection. The occurrence during or after a typhoid fever, the presence of a positive Widal reaction, and the characteristic course of this complication are factors which almost necessarily exclude any other interpretation. Still, in doubtful cases, other causes must be taken into consideration and it might therefore be worth while to call to mind what other etiological factors are liable to produce spinal lesions. These factors are: trauma, infections, rheumatism, parasites, malignant growths.

Cases of spondylitis have been reported caused by the following bacteria: the tubercle bacillus, the pneumococcus (Quinke, Nonne cit. by Oppenheim), the different pyogenic bacteria as the streptococcus after an empyema (Quinke), a staphylococcus in multiple osteomyelitis (Morian, Guyot), or after a phlegmon in the foot (Cantani); after an acne (Hoffman), after tonsillitis (Myers), after scarlet fever (Quinke

and others); furthermore, the gonococcus (Broadhurst cit. by Bæumler, Auerbach cit. by Focken, Schlesinger, Myers, Sayre and Molan cit. by Fluss), the influenza bacillus (Francke, Determan cit. by Milner), the syphilitic virus (Fournier, Myers, Froelich).

Rheumatism has also been a frequent cause of affections of the spine, both the acute inflammatory rheumatism (Bæumler, Focken, Oppenheim) and the chronic. Different types of chronic rheumatism of the spine have been described as the *spondylose rhizomélisque* of Pierre-Marie's and Struempell's type, the chronic stiffness of the spine of Bechterew's type, and the dorsal myopathic rigidity (Senator, Focken).

Actinomycosis of the spine has been reported a few times (Martens cit. by Oppenheim, Schlegel), and intraspinal hydatid cysts have been found by Crevellier and by Lloyd (cit. by Myers).

Malignant growths are known to affect the spine, both primary vertebral sarcoma (Myers and others), and metastatic carcinoma secondary to cancer, mammæ, cancer ventriculi, and cancer prostaticæ.

Therapy.—The therapy of typhoid spondylitis is very simple. If an effective immobilization of the affected part is accomplished, time and nature will do the rest. The remark has often been made in the literature that the pain of typhoid spine is especially refractory to the ordinary analgesic remedies. This is evidently a character which the typhoid spondylitis shares with practically all other bone-lesions; in fact, we do not use morphine as a rule in order to relieve pains when a bone or a joint is inflamed, but we immobilize in a suitable position, we see to it that the surrounding muscles are relaxed and we use hot applications. The same treatment is also indicated in typhoid spondylitis, and it is immaterial whether we simply keep our patient on his back, or use strapping with adhesive-plaster, or apply extension, or put on a spinal brace or a jacket made of leather, celluloid or plaster-of-Paris, or we use a bed of plaster-of-Paris, as long as an immobilization is effected which relieves the patient from his pains. The constant application of heat, as used in two of the cases observed by me, might be of value for the alleviation of pain. The Paquelin cautery, which Gibney so strongly recommends, seems to me superfluous in most cases.

The only drugs that seem to have had any effect at all are aspirin, in a case of Wilson's, and phenacetin in one of mine, in both of which the temperature remained normal and the patient began to improve from the time the first dose was given. Still, it appears to me that in both instances it was a case of *post hoc sed non propter*.

In very protracted cases, I should think a vaccine-treatment would be indicated, such a one as has been successfully employed on "typhoid-carriers" (Irwin and Houston, and others).

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SOME IMPORTANT EAR SYMPTOMS IN GENERAL DISEASES.

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The rôle of the ear in general diseases is well established but unfortunately is too often overlooked.

Nervous Exhaustion from Deafness.—A progressive deafness, with or without tinnitus, is especially important as an etiological factor in general nervous exhaustion and many functional nervous disorders.

"Few intelligent observers, outside of the very deaf themselves, or those who have to deal much with persons so afflicted, can appreciate the profound exhaustion resulting from the effort to compensate for a deficiency in this particular line of communication with the outer world, in the person whose perception of that mode of motion to which we give the name of sound was once made without appreciable effort, and who has, under conditions of impaired hearing, first of all to make an effort to hear, and, in default of hearing, an effort to appreciate vocal utterances by watching the motion of the lips of the speaker; and finally, in default, either through lack of perceptive power or through ability to only catch consonant sounds which are formed in front of the mouth, to solve the puzzle of the spoken sentence by filling in the missing consonant sounds or inadequately seen, from the appreciable context of the sentence; so that where once understanding came without effort, three distinct and appreciable brain-efforts are required; the first, to hear; the second, to see; and the third, to understand" (Dr. Clarence Blake).

Ear Symptoms in Arteriosclerosis.—In arteriosclerosis, the ear symptoms are sometimes the first to call the attention of the observer to this insidious and intractable disease.

The ear symptoms which should direct our attention to a local or general circulatory disturbance, are unilateral or bilateral tinnitus, slight and progressive deafness, loss of air and bone conduction, dizziness sometimes early in the disease, and in the later stages of the disease, sometimes hallucinations of hearing. The ear symptoms necessarily vary according to the extent of the sclerosis. It is well known that in severe hemorrhage or progressive anemia, deafness and tinnitus may occur. If the hemorrhage and anemia are severe and prolonged, deafness may be permanent, being due to an obliteration of some of the blood-vessels of the cochlea or the special cochlea centres in the brain. A passive tinnitus or a passive

dizziness is probably due to a circulatory disturbance in the arteries of the semicircular canal or special centres of equilibration. These conditions are frequently attributed to liver disorders rather than to a valuable symptom of a possibly beginning general arteriosclerosis. A deafness without dizziness, tinnitus, or Ménière's syndromes (provided no mechanical cause or deafness exists), with some general symptoms of arteriosclerosis, is indicative of thickening in the vessels to the nucleus, and if associated with peripheral paralysis, may be indicative of disease of the internal capsule. Loss of hearing with dizziness may be due to a vascular disorder from tumors in the cerebellum, cerebrum, or pons varolii, as well as to a sclerosis of the labyrinthine artery. Loss of hearing and dizziness, continuing for a long time, are valuable signs of vascular disturbances in the entire encephalon. If the eye symptoms are also present, the evidence is complete.

A beginning sclerosis of the vertebral artery may press upon and irritate the cervical sympathetic fibres which send fibres to the labyrinth, supposedly through the non-medullated cells of Remak, found by Erlitzki in the auditory nerve (Bonnier), probably producing a tinnitus or dizziness long before the sclerosis has extended to the arteries of the labyrinth.

Escat calls attention to the sympathetic system and its influence, especially in the production of the serous effusion in Ménière's disease, which may take place in the labyrinth, from a sudden irritation in the vaso-dilator fibres or paralysis of the vaso-constrictors. It must be conceded that any molecular change in the blood-vessel wall, as described by Cohnheim, from intrinsic or extrinsic causes, predisposes to Ménière's disease.

Vasomotor Ataxia.—Vasomotor ataxia, local in character, may occur about the auricle and adjacent structures from irritation of the different ganglia of the ear, causing herpes, simple erythemata and sometimes angioneurotic edema, and we must be careful not to class such skin conditions as a local expression of a mastoiditis or overlook the general causes producing the vasomotor disturbances.

Vertigo in General Diseases.—Another symptom belonging to the internal ear, which is important in many diseases, is vertigo. Vertigo may or may not be associated with nystagmus, and may be continuous or alternating in character. If alternating, it may be said to be due to an explosion, as it were, in the centre of equilibration, situated in the cerebellum or semicircular canals, and is probably functional in character, due to circulatory disturbance or gastro-intestinal disorders. If continuous, it is probably due to a destructive change in the centre of equilibration or semicircular canals, which may result from a tumor or suppuration. Impressions producing functional vertigo travel to Deiters' nucleus by the spinal vestibule tract, the cortical vestibule tract or associated fibres of the cranial nerves.

Symptoms primarily belonging to the labyrinth have too often been ignored or attributed to intracranial lesions or to some general disorder. Dizziness, vertigo, or giddiness, generally considered synonymous terms, may or may not move, and objects, instead of the patient, may seem to we mean a subjective sensation on the part of the patient, or moving about an axis in some special direction in space, but as you know, the patient may or may not move, and objects, instead of the patient, may seem to move. All this may or may not be due to nystagmus.

If we may be pardoned for discussing this feature of the subject in a general way, vertigo may be an acquired or induced disorder, and may be subjective or objective. Turning in space or swaying up and down may be only apparent or real. Vertigo is solely a symptom and may be induced by organic brain disease, hemorrhage, blow upon the head, rapid revolution of the body, sudden change in elevation, looking from unusual heights, ocular muscle incoördination, disease of the stomach, kidney, liver, heart or circulatory system, disease of the middle ear or Eustachian tube, tonic or clonic spasm of the tensor tympani or stapedius muscles, which sometimes occurs when the patient is falling asleep, disease of the internal ear, and sometimes irritation or disease in the external auditory canal, senile arterial change, anemia, etc. Vertigo is frequently a preliminary aura in epilepsy, following a spontaneous motor discharge, which directly or indirectly affects the centres of equilibration. One side of the body is more affected than the other and general incoördination results, and the patient falls or has the sensation of falling. In the vast majority of cases of vertigo, there is a movement of the eyes, though this is not perceptible to the observer.

Differential Diagnosis of Labyrinthine Vertigo.—In vertigo from suspected middle or internal ear disease, a careful inspection should be made under good illumination, for evidence of suppuration. In a chronic suppuration of the middle ear, polypi and cholesteatomatous masses are not infrequently the cause of the vertigo. Suppuration of the labyrinth is a less frequent cause of vertigo than a chronic suppuration of the middle ear and aditus ad antrum. Curettement of the polypi may entirely relieve the trouble and sometimes cure the suppuration. Cholesteatomatous formations more often demand the radical mastoid operation. The relief of the vertigo, however, may be a slow process, requiring many weeks of patient treatment. Vertigo from exanthematous diseases, mumps, fall or concussion, is probably due to an effusion of serum or a small amount of blood into one of the semicircular canals, and with absorption, normal equilibration is restored. If absorption does not occur, a readjustment takes place in the centre of equilibration and the patient feels quite normal. This is sometimes observed in Ménière's disease.

Suppurative middle ear disease may be permanent in character and the patient will, unless constantly supported, fall; if both internal ears are affected, forward or backward; if only one ear is involved, to the affected side.

To discover whether or not the internal ear is normal, out of the many tests and for the sake of brevity, we will call attention first to the tuning fork, and second, to the caloric or irrigating test.

When the tuning fork C 512 is placed directly behind the auricle of the normal ear, it should be heard for twenty seconds, and if the vibrations are only heard for ten seconds, we know there is some disease of the cochlea and probably of the semicircular canals, a condition always observed in arteriosclerosis and sometimes in syphilis. If dizziness is present, we conclude that one or all of the semicircular canals are diseased. The tuning fork gives no information in regard to the semicircular canals, but is of certain value in ascertaining the sensibility of the cochlea.

In the caloric test we produce a nystagmus or oscillating movement of the eyes. One movement is quick and the other slow, and both are rhythmic in character. In the individual with a normal internal ear, after a stream of cold water has been directed against the drum, or middle ear if the drum has been destroyed, a rhythmic nystagmus will be observed: the slow movement to the side irrigated and the quick movement to the opposite side. If the quick movement is to the right side, we diagnose it nystagmus to the right, or vice versa. If the short movement is to the side irrigated, a suppurative process in one of the canals is present. If no reaction results, a complete destruction of the semicircular canals upon the side irrigated has probably occurred. With such a finding, and vertigo and vomiting persisting, exploration of the semicircular canals is indicated. Dizziness, vomiting and tendency to fall to the affected side persisting after exploration of the semicircular canals, exploration of the cerebellum may be necessary, the presumption being that a cerebellar abscess exists.

Suppurating Ear as a Cause of Metastasis.—A suppurating ear as a cause of metastatic abscess in the brain, lungs or liver is so well known that I need not dwell upon this feature of the subject other than to remark that too often a general septic thrombophlebitis is attributed to some general infection rather than to a condition originating in a suppurating ear, which is only taken into consideration after the disease is well established and beyond surgical interference. A chronic suppuration of the ear is certainly a menace to life, and any rise of temperature or slight pain in the region of the ear affected should, in the absence of a distinct cause, be looked upon with grave suspicion as originating from the ear.

Suppurating Ear as a Cause of Spread of Disease.—A suppurating ear as a cause of the spread of disease is quite apparent to many observers. A few years ago a woman of about fifty years of age presented at the clinic of the Indiana University School of Medicine, apparently suffering from the most excruciating pain in the ear. Examination of the drum showed it to be slightly bulging, creamy in color, and without a vestige of redness about the drum or canal. She said that a number of weeks

before she had suffered from a sore throat and the earache began at that time. We did a paracentesis and a thick pus drained out. Bacteriological examination showed the presence of Klebs-Loeffler bacilli. The unbearable pain continued and we did a simple mastoid operation. This did not relieve the discharge of pus and two weeks later we operated a second time, doing the radical mastoid operation. Bacteriological examination of the pus made both at the first and second operations showed the presence of Klebs-Loeffler bacilli. As evidence of the virulence of the infection, one of the attending nurses contracted nasal diphtheria, requiring eighty thousand units of antitoxin to block the disease.

Precautions against the spread of infection should not only be taken in suppuration of the ear following diphtheria, but also in suppuration following typhoid fever, scarlet fever, measles and tuberculosis.

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PRE-HIPPOKRATIC MEDICINE.

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It seems strange at first sight to read that Hippokrates, the father of medicine, should in the fifth century B. C. have written a treatise "Upon Ancient Medicine," but when one reflects upon the high degree of skill that the acute intellects in the age of Perikles had developed from tradition and observation, it is not surprising that they should turn back with curiosity to investigate the cruder beliefs of a former and less enlightened time. Hippokrates, reared in an Asklepiad family, amid medical traditions, and tracing his genealogy back through fifteen supposed ancestors directly to Asklepios, thought that medicine as a science had originated through experience of substances found useful for the health, much in the same way as dietetics had developed.¹ Those classic writers who treated of the history of medicine took a similar rational view of its origin, and Celsus at the beginning of the Christian era speaks of Aesculapius, who, because he cultivated with a little more skill the science of medicine which before his time had been rude and common to all men, was received into the number of the gods. Also he speaks of the early philosophers skilled in medicine, of whom the most notable were Pythagoras, Empedokles, and Demokritus. The last of these was the teacher of Hippokrates of Kos, the first memorable man who separated the study of medicine from that of philosophy.²

But modern research takes us back to and supplies us with definite information regarding the medicine of a period as far removed from that of Celsus as he is from our own time.

Medicine begins with primitive man in much the same fashion, no matter whether he is the Accadian of four thousand years ago, the Red Indian of a few generations back, or the simple South Sea Islander of to-day. In his earliest development the medicine man is the magician as well as the healer. He controls the elements, placates offended deities, and heals disorders of the body.

If we go back to the first records of those people in the valleys of the Nile and the Euphrates to whom we owe the beginnings of our civilization, we find that medicine had already, under their earliest kings, developed beyond this primitive stage and had become a distinct and a respected calling. In Egypt the names of at least two of these early physicians have come down to us. Nenekhsekhmet was chief physician to one of the kings in the Fifth Dynasty (2,700 B. C.) and his tomb at Sakharah

records his high standing at the court and the gratitude of his royal master.³ Even at this early period some elementary knowledge of the structure of the body and course of the blood-vessels was taught, as we find from a reference in the Ebers papyrus, while the surgery of Nenekhsekhmet's time had advanced to a considerable degree of skill.⁴ In a sand grave of this period a body has been found of which the femur, broken by an accident that caused the patient's death, is still surrounded by the splints with which a surgeon of the time has sought to remedy the displacement and promote the healing of the fragments. These splints extend from about the groin to well below the knee, are protected by linen pads, and fastened by linen bands, so that had the patient lived a useful, albeit shortened limb would most probably have resulted.⁵ These early practitioners were well aware of the necessity that a broken limb should be kept at rest, supported by splints, though they had not yet devised any means of combating the great tendency to shortening. Accordingly we find that in a land teeming with people busy in the arts of building and of commerce and active in warfare, graves containing remains with fractures that have healed are by no means uncommon. Although in the graves of prehistoric Egyptians the bones have united in all manner of distorted positions, when we come to those of the Fifth Dynasty and onwards, we find that the practitioners who rendered aid to the injured had sufficient skill in applying splints to prevent any gross distortion after union.⁶

A more shadowy, though older, representative of the healing art than Nenekhsekhmet is found in the god I-em-hotep who, in all probability the apotheosis of some famous physician of an early dynasty, had become the fashionable and popular object of worship at Memphis long before the days when Israel sojourned in the land of Egypt. When at a later date the Greeks were admitted into Egypt, they identified him with their Asklepios.⁷

Separated from Egypt by what in those early days was a stretch of desert almost impassable to invading armies, lay the great civilization of the Chaldean and Assyrian states in the Euphrates valley. The latest research among the cuneiform tablets unearthed from the remains of cities in this region, sacked, buried and all but forgotten for many ages, has discovered a civilization which in its social and commercial institutions was most highly organized. Two thousand years B. C. in the time of King Hammurabi of Babylon, we find a society in which equitable laws relating to marriage, slavery, commercial transactions and buying of land were enacted and administered. Even the medical profession was protected and, if need be, punished by the laws. From the code of this king we learn that surgical treatment of wounds, cataract, broken limbs, and the bowel was carried out, the remuneration varying from ten to two shekels according to the circumstances of the patients (that is roughly from \$5 to \$1). If, however, the patient's life or eye was lost through

malpractice, the doctor's hands were to be struck off.⁸ This last regulation, seemingly hard upon what might be a pure misfortune, was probably intended to be carried out only as a protection against quacks, and it may be compared to a modern occurrence related to the writer by a friend in the Medical Service of the British Colonial Government. A negro with an old standing inguinal hernia met two other natives in the forest of Nigeria who professed to be able to cure the trouble at once. This they did by laying him on his back, plunging a knife into the swelling and collecting their fee, after which they decamped. Suffering from peritonitis, the unfortunate patient was carried for two days' journey to the nearest hospital, which he reached in a dying state. The arm of the law, however, found the bogus surgeons, who received two years' imprisonment for their quackery. Four thousand years ago this malpractice would have been effectually stopped by the simple and exemplary method of cutting off the hands.

With regard to the character and usefulness of native Assyrian medicine, we must remember that it was practised among religious and intelligent peoples of whom it has been said that a "right thinking citizen of a modern city would probably feel more at home in ancient Babylon than in mediæval Europe."⁹ The average Babylonian was a just and simple man, living under equitable laws and carefully framed commercial contracts. His skill as an architect, engineer and artist was considerable, and for his success in military operations, his care in matters of trade, and his studious observation of natural facts, he commands our admiration as a warrior, a merchant, and even as a moderate scientist. That medicine was a calling of importance among such people shows therefore that it must have been of use, and in accordance with its eminently theurgic and mystical nature we must conclude, that among Semitic races of exalted imaginative temperament the employment of mental modes of healing was perhaps found even more beneficial than the administration of the natural and generally simple substances in which their physicians dealt.

When we come down to a period five hundred years after King Hammurabi's time, we find that the centre of political power in the antique world had shifted to the land of Egypt, which, under the Pharaohs of the New Empire, ruled the lands and exacted tribute of the peoples from the Euphrates to the Libyan desert. To this time belongs the Ebers papyrus, the oldest book upon medicine.¹⁰ In its 107 pages of hieratic writing, we find several of our modern drugs, like cedar-wood-oil, turpentine, opium, squills, myrrh, yeast, blue-stone, lime, soda, nitre, but many of the remedies cannot be translated because their names are not found in any other writing. Not only were medicines thus administered internally by the Egyptian physician of 1500 B. C., but ointments, plasters, suppositories, inhalations, enemata, the cauter, and the knife were methods by which disease was externally attacked. Tumors were re-

moved and abscesses opened by finely moulded bronze knives like three which the present writer has figured in a recent paper.¹¹ Many of the prescriptions, however, it should be stated are fatuous and contain disgusting remedies such as the parts and excrement of various clean and unclean animals. Charms, too, were of great importance, and the Egyptian who carried on his person the Utchat or amulet of the Eye of Horus was likely to be safe and happy; while before the drinking of medicines it was necessary to invoke with appropriate ritual the help of



Fig. 1. Statue of Auta, a physician of 1500 B. C.
(From the Ethnographical Museum, Leyden.)

Museum of Leyden a statue of Auta, a physician of 1500 B. C. This statue which, like other carvings of the time, we may assume to be a Ra, Isis, Horus, or Osiris as the case might be. As a type of the men who used these books and instruments, we have in the Ethnographical faithful delineation of the deceased, presents a sturdy, round faced, pleasant-looking little man with shaven head, seated clothed in a pleated

linen robe and wearing sandals on his feet. With regard to the diseases from which the ancient Egyptians of this period suffered, the mummies, whose internal organs have been removed, give us, of course, little help, but we gain much information from bodies which have been found buried in the sand with the soft parts shrivelled but preserved to a wonderful extent.¹² Thus we know that rheumatoid affections were particularly prevalent in Egypt then as they are to-day; that atheroma might affect the blood-vessels; small-boned limbs have been found as if from the effects of infantile paralysis; and bones showing ulceration, apparently from the erosion of malignant tumors; also several skeletons have been found showing destruction of vertebræ and spinal curvature, the result probably of tuberculosis.¹³ Modern methods of softening the tissues of mummies have made it possible to demonstrate by histological means that the Egyptians of 3,400 years ago suffered from the same diseases of blood-vessels and kidneys which the descendants of these people show at the present day.

When one tries to form a judgment of 18th dynasty Egyptian medical practice (1500 B. C.), one reflects that it existed for a people who passed a primitive but glorious life in the sunshine of the long valley watered by the bounteous Nile. They reaped the heavy crops that sprang from the river's superfluity; their workmen and sculptors toiled to raise stately temples and to hew colossal statues that bade fair to make their generation as famous as the ancestors who centuries before had built the pyramids; their artists possessed a power of delineation so simple and so telling that it bears forever the stamp of genius; their priests copied and composed writings which contained the sum of human knowledge to their time, and a singular mystic lore supposed to give its possessor wondrous power over the brute forces of outside nature; their craftsmen wrought all sorts of beautiful implements and arms in hardened copper, and fashioned jewels of gold, silver and precious stones for the wealthy nobles who lived in rich villas by the Nile and hunted in its marshes. Amid these surroundings it cannot be doubted that the physician using the means we have described attained to a high degree of skill as he certainly occupied a high place alike in royal and in popular esteem. While it is true that the precise methods of our present scientific medicine were unknown to him, he possessed in all likelihood powers of observation and generalization which would go far to counterbalance the defect. Like the Assyrian doctor, too, he possessed an important ally in the mysticism and reliance upon supernatural agency which formed so large a part of his patients' creed. Every disease was a kind of possession of the body by demons or other baneful agency to be removed partly by prayer and exorcism as well as by drugs and other corporeal applications.¹⁴

After this period of Egypt's greatest glory, we find the dwellers in Greece and the people of Assyria gradually rising into power and prominence. A people of Asiatic origin flourished and declined at Mycenæ, in

Crete, and in the Aegean Isles, upon whose luxury the later poets longingly looked back as the age of gold. But we know nothing of their medicine save that they could build healthy dwellings with well constructed drains. Later among the Homeric Greeks of 1000 B. C. the healer was held in high repute. There is a passage in the *Odyssey* from which we gather that the professional classes were those of the soothsayer, the bard, the physician, and the builder of ships, and in which we are told that these men, even when strangers, are welcomed at any banquet over all the wide earth.¹⁵ In the *Odyssey* the connection of Greece with Egypt is indicated by a passage that speaks of Helen as having learned the uses of many healing and baneful drugs from Polydamna, a woman of Egypt, "where each man is a skilled physician."¹⁶ Though the Homeric healer was no less a warrior because of his beneficent calling, he was more valued for his healing powers, and we read that "a physician is worth many other men to cut out arrows and to spread soothing drugs." No doubt the greater part of the Homeric medicine consisted simply in the extraction of missiles and the application of drugs to remove the pain of wounds.¹⁷

If we turn again to Assyria in the 7th century B. C. we find medicine not very highly developed, it is true, but its practitioners flourishing from a social standpoint and much sought after. Out of the library of Assurbanipal, inscribed in cuneiform characters upon baked clay tablets, which had remained in the ruins of Nineveh from its sack in 606 B. C. till they were discovered and brought to the British Museum in the 19th century, nearly five per cent. were medical works.¹⁸ In these, so far as they have been yet deciphered, we find substances like oils of sesame, olive and castor, syrup of dates, honey, salt, and numerous other drugs of which the names cannot be translated; but there is a great amount of ritual, and apparently the mode in which remedies were administered counted for as much as the remedies themselves.¹⁹ Numerous metrical prayers for recovery from sickness have also come to light.²⁰ The profession of magician was an important one in Babylonia and Assyria at this time, and was indirectly connected with that of medicine. For ages the Babylonian astrologers had been observing and recording facts, and it was natural to suppose that if certain facts, such as peculiar positions of the planets in the heavens, had in the past been followed by exceptional terrestrial occurrences, the same state of matters occurring again in the heavens would be followed in future by similar occurrences upon the earth. This assumption, it is true, forms the basis of all science, but the Babylonian made the essential mistake of grouping together in a causal relation facts which had no connection with one another. We find that the Babylonian state magicians submitted to the King monthly reports for his guidance. In such matters as the prediction of weather conditions, they may have given useful information, but on serious political prophecies such as the result of war with a neighboring kingdom they

often saved their reputation by giving an alternative prediction such as the possibility of a bad harvest. From one of these monthly reports we learn that the professions of physician and magician had already become distinct, for we find one of the latter craving medical assistance,—“Bilipus, the Babylonian magician, is very ill; let the King command that a physician come and see him.”²¹

The higher physicians were important men about the Assyrian court, and letters from one of them, by name Aradnana, to his royal master, Esar-haddon, have come down to us. In one of these he speaks of curing an inflamed condition of the Prince's eyes, in another of stopping bleeding from the nose, in still another he directs the King to anoint himself as a protection against draughts, to drink pure water, and to wash his hands

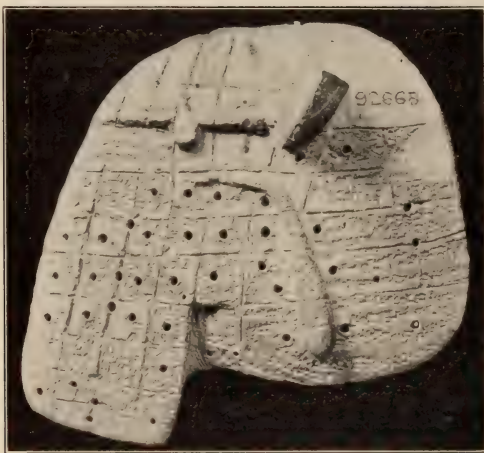


Fig. 2. Babylonian Clay Liver used for divination.
(From the British Museum. Photo by Mansell.)

frequently.²² From temple records we also know that the Babylonian temples had doctors attached to them among their other officers.²³

Another practice in which medicine, or at all events pathology, came into contact with the realm of magic was in the art of divination by inspection of the liver in sacrificial animals. There was a wide-spread idea in the ancient world that the examination of the liver and the position of flakes and thickenings upon its surface helped to foretell events of the future. The liver indeed seems by the Semitic peoples to have been regarded as the chief organ of the body and dwelling of the soul. Not only has a Babylonian clay liver been found carefully mapped out in squares

which indicated the prophetic importance of each part in foretelling political events or prognosticating recovery from sickness,²⁴ but a similar object made of bronze has been found in Italy as a relic of the ancient Etruscan soothsayers, plotted out in areas upon which are inscribed the names of various gods. Doubtless these objects were used as a kind of hand-book in divination by the persons whose business it was to read the signs that told events about to happen.²⁵ Plato even in the 4th century B. C., defends the idea, which appears to have been generally accepted in his time, and explains how the liver may come to be a mirror of passing events.²⁶

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Following upon the sack of Nineveh by the Medes and Persians in 606 B. C., the Assyrian organization, including its medicine, passed away; but the physicians from Greece and Egypt maintained an influence so powerful at the Persian court that they directed in some instances the foreign policy of their adopted country. Cyrus the Great (about 530 B. C.) welcomed all physicians to his court, and their medical stores formed, as Xenophon tells us, an important adjunct to the equipment of his military expeditions.²⁷ Cambyses was so much under the domination of an Egyptian physician that the latter, to gratify a private grudge against Amasis, king of that country, was able to induce the Persian to conduct an expedition to the conquest of his former land.²⁸ A similar result was almost brought about with regard to Greece and its colonies in Italy by the ruse of a Greek physician, Demokedes, who obtained great influence over Darius, King of Persia, and his consort, by having cured both of serious affections, but who yet longed to return to his Grecian home. The history of this Demokedes, related at length by Herodotus, gives a vivid picture of his times (500 B. C.), and incidentally we learn from it that public medical officers were then employed by the various Greek towns at the yearly salaries of:

Ægina, 60 minae (\$1,170).

Athens, 100 minae (\$1,950).

Samos, 120 minae (\$2,340).²⁹

Demokedes offers a point for comparison between Egyptian medicine and that of Greece, for so disgusted was the Persian king with the clumsy treatment meted out by Egyptian physicians to his injured foot compared with that undertaken later by the Greek that he was about to put the Egyptians to death had Demokedes not craved their lives as a royal boon. A still more important connecting link was formed by an earlier countryman of Demokedes, the philosopher Pythagoras, who lived sometime before 500 B. C. and who was closely identified with Samos and Kroton, a Greek colony in Italy. It is commonly accepted that Pythagoras had resided for some years in Egypt, and that from the mystic rites of this country he had developed many of his curious religious tenets. Accord-

ing to one tradition, he brought back with him to Greece that remedy which still figures in pharmacopœias and is known as oxymel of squills. Milo, the father-in-law of Demokedes, was one of his immediate disciples. Pythagoras taught the kinship of beasts and men, and as a corollary the necessity to abstain from animal diet, and the transmigration of the soul. It is interesting, too, from a medical point of view to note that both Pythagoras and Empedokles in the strongest terms forbade their followers to partake of beans, apparently in some way recognizing the very close similarity that exists in the composition of these legumes and of animal flesh. The story is even related that Pythagoras, pursued by his enemies, suffered death rather than trample through a field of beans which lay upon his line of flight.⁸⁰



Fig. 3. Health Temple at Epidauros in the 4th Century B. C.
(From a painting by Mr. W. M. Glass in the writer's possession.)

Doubtless this intercourse of Greeks in Ionia and in Italy with the people of Persia and of Egypt effected, even at this early date, the introduction of many practices and ideas into the philosophic medicine of Greece. Nor must we forget the influence of the Phoenician traders in diffusing the practices of Semitic medicine around the Eastern Mediterranean shores.

Greek medicine in the Hippocratic sense was, however, a plant of purely native growth and owed little, save the knowledge of certain drugs, to

any countries of the east or south. It is necessary to recognize three separate and quite distinct forms of Greek medical development. Firstly, there were the early philosophers whose speculations brought them closely into touch with the healing art; while perhaps they did not as a rule attempt the cure of sick persons, yet a thorough knowledge of the art formed an important part of their philosophical equipment. Secondly, there were the temples of Asklepios which had existed as sanctuaries of theurgic healing from prehistoric antiquity. Thirdly and closely connected with the last, were the Asklepiad schools or guilds of physicians proper, the chief of which were situated at Knidos, Kos and Kroton. These began to develop in importance as distinct from the profession of philosophy only a little time before the period of Hippokrates.

Firstly, with regard to the philosophers, one of the earliest was Thales, founder of the philosophic School at Miletos. The date of his birth is usually given as about 625 B. C., and he was in his prime about the year 585. He is chiefly of interest, so far as our present purpose is concerned, because he forms an example of the early connection that existed between Greek philosophy on the one hand and the thought of Egypt and the East upon the other; for he appears to have been of Semitic origin and had been to Egypt in his earlier years.³¹ Medicine is more concerned with his disciples or associates, Anaximander and Anaximenes. Anaximander, who was some forty years older than Pythagoras, was the first to suggest that living creatures arose from the moist element and the human being from fish-like ancestors.³² His speculations, confirmed by the precise methods of our own day, were apparently the result of examining the embryos of men and fishes. Anaximenes, his younger associate, propounded the view that air was the infinite substance and formed the soul of men,—a theory which, together with the teaching of Empedokles, regarding respiration, had a most important influence in moulding the Hippokratic doctrines.³³

Pythagoras, as we know, settled in his prime at Kroton, and his dwelling here may have had an important influence upon the medical school already established in that place. No doubt, however, most of the legends told of him by his later followers are without serious foundation, and whatever may be the debt owed to him by philosophy, in the healing art his merits are sufficiently covered by the title of "medicine man."

Alkmaion of Kroton, a pupil of Pythagoras, was a more distinguished figure in the history of medicine. In the first place he originated the view that the brain is the common sensorium, an idea at which he arrived probably from making dissections of the body. This being the case it is likely that we owe to him the first discovery of the cranial nerves. Their proper function to convey sensory impressions was not, however, generally recognized for another couple of centuries, since Hippokrates still regarded the blood as a means of sensory communication, while even Aristotle (circa 350 B. C.) confused the channels afforded by these nerves

with arteries going to the brain.³⁴ Alkmaion also advanced theories as to the working of the various organs of the senses, and here again he was a pioneer, attributing the act of vision partly to something reflected on the eye from the outer world and not simply regarding it as produced within the eye itself. With regard to disease, he was one of the first to treat health as a state of "isonomy" in which outside things like moist and dry, cold and heat, were evenly balanced. Disease was, on this theory, the "monarchy" of any one of these, a kind of "injustice" in the microcosm of the body.³⁵

Philolaos, another Pythagorean and an older contemporary of Hippokrates, wrote also upon medicine. He held that the body was built up only of warm things to which the cold was added by way of respiration. He made blood, bile and phlegm to be the causes of disease, a further and more definite step than had been taken before his time in the establishment of that humoral pathology which, elaborated in the Hippocratic writings, survived him by over two thousand years.³⁶

Empedokles of Akragas flourished about the time Hippokrates was born and was a great democratic leader in his native city as well as a philosopher. The former aspect of his activity is proved by a tradition that on one occasion, having been at a dinner party where the host and a public official of the city had arbitrarily commanded the company to drink the wine provided or have it poured upon their heads, he next day brought these two persons before the city council and had them condemned and put to death as tyrants. In addition to being a statesman and philosopher, he was, like Pythagoras, a "medicine man." Galen makes him out to have been the founder of the Italian school of medicine which he puts upon the same level as those of Kos and Knidos.³⁷ Certainly he had great repute as a healer in his day, for a case is recorded in which he brought back life to a woman who had been breathless and pulseless for thirty days (a case apparently of hysterical suffocation).³⁸ He sweetened the pestilential marshes between Selinus and the sea by diverting the rivers Ilypsas and Selinus into them and thus freed the city from malaria.³⁹ He held that the four elements were to be identified with the heat, cold, moist and dry—another contribution to the doctrine of the humours, so far as the elements concern the body. Respiration he believed took place through the pores existing in the skin, and he regarded the heart, not the brain, as the region of consciousness. This doctrine was in close conformity with that of ancient Egypt and in part persisted even in the writings of the Koan school of medicine and in the works of Plato.⁴⁰ Unlike the rationalism in medicine characteristic of the school of Kos, where in the whole collection of writings known as the *Corpus Hippocraticum* we meet with not a single suggestion of the use of magic, the followers of Empedokles still clung to ideas of a superstitious nature. Against this attitude we read the protest of Hippokrates in his work on the "Sacred Disease" where he speaks of

"magicians and purifiers and charlatans and quacks who profess to be very religious." And Hippokrates adds, "if they profess to know how to bring down the moon and darken the sun, and induce storms and fine weather, and rains and droughts, and make the sea and land unproductive, and so forth,—whether they arrogate this power as being derived from mysteries or any other knowledge or consideration, they appear to me to practise impiety, and either to fancy that there are no gods, or, if there are, that they have no ability to ward off the greatest evils." As Empedokles is the most important of those who preceded Hippokrates in the art of medicine, we may be pardoned for giving the following quotations characteristic of his works:—

"Thus do all things draw breath and breathe it out again. All have bloodless tubes of flesh extended over the surface of their bodies and at the mouths of these the outermost surface of the skin is perforated over with pores closely packed together so as to keep in the blood, while a free passage is cut for the air to pass.

"Even so when the thin blood that surges through the limbs rushes backwards to the interior, straightway the stream of air comes in with a rushing swell, but when the blood returns the air breathes out again in equal quantity.

"The heart dwelling in the sea of blood that runs in opposite directions where chiefly is what men call thought; for the blood around the heart is the thought of men..

"And thou shalt learn all the drugs that are a defence against ills and old age, since for thee alone will I accomplish all these. Thou shalt arrest the violence of the weariless winds that arise and sweep the earth; and again when thou so desirest thou shalt bring back their blasts with a rush. Thou shalt cause for man a seasonable drought after the dark rains and again thou shalt change the summer drought for streams that feed the trees as they pour down from the sky. Thou shalt bring back from Hades the life of a dead man.

"Straightway whenever I enter with these in my train both men and women, into the flourishing towns, is reverence done me; they go after me in countless throngs asking of me what is the way to gain; some by the grievous pangs of all manner of sickness beg to hear from me the word of healing."⁴¹

Secondly, with regard to the temples of Asklepios. It is doubtful whether the philosopher-physicians regularly engaged in the practice of healing, a pursuit which they would probably have treated with some disdain. The shrines of Asklepios, however, must have derived no inconsiderable part of their revenue and reputation from the success with which benefit was sought by followers of the god. The origin of Asklepios is shrouded in obscurity, but later opinion in Greece attributed his birthplace to Epidaurus, a town of the Peloponnese on the opposite side of the Bay of Ægina from Athens, sometimes distinguished

as the "Sacred Epidaurus." At all events it is certain that the cult of Asklepios as a healer originated from Epidaurus. Out of this temple his worship passed to other places, so that no less than 320 of his shrines were scattered throughout the Grecian world.⁴² Almost all of these were places of healing, though the most famous were situated at Trikke, Kos and Epidaurus. Pergamus, the city famous six centuries later as the place of Galen's birth, held a temple of Asklepios which became a favorite resort in after times, and in Athens there is at the foot of the Acropolis a ruined shrine supposed to have been a branch of that in Epidaurus. From its proximity to Athens, the commercial advantages of its position, and the fame of its Asklepiian temple, Epidaurus enjoyed no small importance. About five miles from the city stood the temple, in a beautiful valley amidst the mountains, and here the festival in honor of Asklepios was celebrated with sports every fourth year, nine days after the Isthmian games at Corinth. In the sacred enclosure there were temples of Asklepios and Artemis with, some distance off, upon the slopes of Mount Kynortion, a temple erected to Maleatean Apollo. Upon the lower slopes of this mountain stood an open-air theatre capable of holding 12,000 persons on its marble benches, while there was, immediately outside the temple precincts, a stadium for 20,000 spectators in which the athletic games took place.⁴³ The element of pleasure was therefore not wanting in a visit to Epidaurus, and we can well understand how the return to health of the convalescent was quickened or the self-centred thoughts of the hypochondriac were distracted as he sat in the beautiful theatre drinking in the brilliant, fragrant air of Greece, with the olive clad slopes and the sparkling marble temples stretching before his gaze. By night the sick person spread his pallet within the temple precincts, hoping that in a dream the god would reveal to him the method of his cure, and during the day-time he presented his oblations at the shrine or sat in marble shelters protected from the wind and attended by the priests and priestesses, or even—though this was considered a peculiar honor—he might be caressed by some of the large snakes or dogs held sacred to the god. Outside the temple precincts stood numerous hostels and, at all events in Roman times, magnificent baths designed for the use both of the diseased and healthy, and a hospital where the dying might pass away in peace. Pausanias, who wrote a description of the temple at a later period, tells us that "tablets stood within the enclosure. There used to be more of them. In my time six were left. On these tablets are engraved the names of men and women who have been treated by Asklepios, together with the disease from which they suffered, and the manner of the cure. The inscriptions are in the Doric dialect."⁴⁴ As to the nature of the cures recorded on these tablets, the inscriptions gave sometimes a somewhat ludicrous account; for example: "A man had his toe healed by a serpent. He was suffering dreadfully from a malignant sore in his toe when the servants of the temple took him outside and set him on a

seat. When sleep came upon him a snake issued from the abaton and healed the toe with its tongue and thereafter went back to the abaton. When the patient woke up and saw that he was healed, he said that he had had a dream that a beautiful youth had put a drug upon his toe." * * * * "Heraieus of Mytilene. He had no hair on his head but an abundant growth on his cheeks. He was ashamed because it made him an object of laughter. He fell asleep and the god by anointing his head with some drug succeeded in producing hair thereon."

These records of the cures were very ancient and by the time of Hippokrates the healing of the temples had come to be an object of mirth and sarcasm, as we see from the humorous account given in the *Plutus* of Aristophanes where the God of Wealth, in order that he may distribute favors more justly, is cured of his blindness by a visit to the shrine at Athens.⁴⁵ Yet in later days when faith in the anthropomorphic gods of Greece was dead, the healing of the temple still continued, for men shared the belief of that traveler from Sidon with whom Pausanias met and conversed in the temple grounds, that "Apollo was the sunshine and Asklepios the fresh air."

With regard to purely medical treatment, Hippokrates was, as Celsus stated, the first person of importance to separate medicine from philosophy, and accordingly a consideration of the third class of medical practitioners, who bound themselves together at first in families to which medical traditions were rigorously confined, and afterwards in guilds to which strangers were admitted on the terms stated in the Hippokratic oath, is beyond the scope of the present article. These Alklepiad guilds, which developed later into the medical schools of ancient Greece, originated for the most part in places where shrines of Asklepios had been established, *e. g.*, at Kos and Knidos. It must, however, be remembered that the physicians were quite distinct from priests, just as they were later separate from the philosophers.

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A PRACTICAL SURVEY OF PRESENT DAY PHYSIOLOGY OF THE STOMACH.

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A description of the movements of the stomach during digestion will gain in clearness by a preceding brief review of the anatomical divisions of that viscus. About two inches from the pylorus, there exists a collection of circular muscle fibers designated the sphincter antri pylorici. Its position is frequently marked by a constriction on the outer surface of the stomach. Between the sphincter antri pylorici and the pylorus is the pyloric antrum. Functionally, the fundus may be considered as extending from about midway between the sphincter antri pylorici and the cardiac orifice to about an inch above and several inches to the left of the latter. From the beginning of the fundus up to the sphincter antri pylorici is an intermediate zone which may be referred to conveniently the pre-antral part of the stomach. Gradually deepening annular con-thick rings, the last of which projects inward as the pyloric sphincter. A "dilator pylori" (Rudinger) has been described as being formed by inner fibers of the longitudinal layer connecting with the pyloric sphincter.

Opening and closure of the cardiac orifice appears to stand in reflex relation to deglutition. As observed in the rabbit, the cardia dilates at the beginning of every act of swallowing and again contracts after its completion. Contraction as well as dilation are controlled by the pneumogastric which contains both excito-motor and inhibitory fibers, each kind being in part afferent, in part efferent. Nervous eructation is often induced or perpetuated because of repeated inhibition of the cardia by habitual air-gulping practiced to relieve a feeling of epigastric distention.

Having passed the cardia, food is not evenly distributed throughout the stomach, neither is it churned nor made to circulate over the mucous membrane as was formerly taught. The bulk of it accumulates in the fundus where absence of peristalsis prevents uniform acidulation and therefor permits longer action of the saliva on starch. The tonicity of the fundus musculature is regulated by the degree of distention, so that the contents are subjected to a steady pressure. From time to time, a slow contraction of the fundus forces a small portion of its contents into the pre-antral part of the stomach. Gradually deepening annular constrictions travel from here to the pylorus at nearly regular intervals. As long as this orifice remains closed, the tendency of these moving rings of contracture is to alternately advance and then drive back the digesting mass. At irregular intervals, the pylorus opens; a contraction of the

sphincter antri pylorici and then of the antrum itself occurs, propelling what chyme has been sufficiently softened on into the duodenum. The sphincter antri pylorici ordinarily contracts so vigorously as to give an hour-glass shape to the stomach. It has been observed, however, that this muscle may functionate imperfectly, allowing a reflux of chyme when the antrum contracts. Possibly this is a factor tending to prolong the sojourn of food within the stomach in some examples of simple gastric myasthenia.

The pyloric sphincter acts in an automatic and purposive manner. Portions of food that are too bulky or hard find their passage barred by its contraction and are returned for further digestion through the relaxing sphincter antri pylorici. On the appearance of free hydrochloric acid, the pylorus opens, permitting egress to part of the acid chyme. But no sooner has this acid chyme entered the duodenum, than it at once provokes reflex closure of the pylorus which endures until neutralization has been accomplished. Whatever favors a speedy accumulation of acid, hastens the emptying of the stomach, and whatever opposes this, retards the discharge of chyme. Since proteids have strong acid affinities to satisfy, they are later and slower to leave the stomach than carbohydrates. Fats likewise leave slowly. Not only do they repress the formation of acid, but when a portion enters the duodenum, the pyloric sphincter contracts until emulsification has taken place. Unless finely divided and intimately mixed with the rest of the ingesta, fat continues to collect on the surface of the chyme, thereby still further prolonging its sojourn within the stomach. Butter passes out somewhat more rapidly than lard.

Water and weak solutions of common salt leave the stomach very rapidly. Of half a liter, three-fifths have passed the pylorus in ten minutes, and almost the whole quantity is out in half an hour. Bouillon leaves the stomach almost as rapidly as water, but even weak solutions of hydrochloric acid require considerably more time. Of milk, 64 per cent. has passed out in half an hour, but of beer, only 45 per cent. Nearly all of a thick soup in quantity not exceeding 200 c.c. will have found egress through the pylorus in one hour; but, like beer, leaves behind a considerable residue of liquid consisting of almost pure gastric juice. Within limits, thinning carbohydrate food with water makes little difference in its rate of egress from the stomach, but when proteid food is thus diluted, it passes out more rapidly, evidently because a given amount has less acid affinities to be combined. Coarse, branny food is discharged a little more quickly than similar food of finer texture. Acid food incites deep and rapid peristalsis, but the outgo of hyperacid food is much slower than that of food possessing approximately normal acidity, most likely because of longer duration of the duodenal acid reflex. Alcohol disappears from the stomach two and a half to three and a half times as fast as solid food taken simultaneously. Large doses weaken the gastric movements. Hard morsels in the food prolong its stay to a marked

degree. An irritated colon has a pronounced adverse, reflex influence on gastric discharge. Distension of the stomach with air, by preventing contact of its walls with its contents, interferes with proper mixing and propulsion of the chyme and thus retards its outflow. Certain other circumstances which affect the transit of gastric contents indirectly and in a purely mechanical way may be mentioned in this connection. An empty transverse colon, for instance, facilitates their passage into the duodenum. Reclining prone or supine is more favorable than standing, sitting or lying on the left side. Walking rapidly is still more favorable, though not as much so as lying on the right side.

When the stomach contents are excessively fatty or acid, also during continued fasting, a mixture of bile, intestinal, and pancreatic juice regurgitates through the pylorus. The quantity varies from a trace to an amount sufficient to transform the type of digestion from gastric to intestinal. This occurrence will have to be reckoned with as a possible factor disturbing the data of chemical investigation. As such regurgitation can be induced by a suitable test-meal, clinicians already have availed themselves of this means to obtain bile or pancreatic juice for diagnostic purposes.

Animal experiments indicate that the centers for gastric movements are located in the basal ganglia and the upper part of the spinal cord. From the latter location emanate inhibitory impulses only; from the former, excito-motor for peristalsis, and both kinds of impulses for the orifices. The conduction paths are in the vagus and sympathetic. With exception of those fibers in the vagus already referred to as concerned in relaxing the cardia, this nerve (according to most investigators)* conveys only excito-motor impulses to all parts of the stomach. The sympathetic, on the other hand, appears to supply inhibitory as well as excito-motor fibers to both the walls and orifices of the stomach. The connection of gastric motility with the activity of higher nerve centers is illustrated by the fact that rage, anxiety, vexation or distress completely check the movements of the stomach.

The gastric mucosa seems to be entirely devoid of temperature sense. Sensations of heat or cold referred to the stomach when hot or cold food is taken really originate in the lower end of the esophagus. 48 per cent. alcohol gives rise merely to a feeling of warmth in the region of the stomach, if the application be strictly confined to that viscus; but if any touch the lower end of the esophagus, a burning akin to pyrosis is experienced. It is possible that heartburn may sometimes arise because alcohol produced by fermentation within the stomach regurgitates into the esophagus. Be that as it may, it is certainly unlikely that hydrochloric acid alone can be held responsible for this symptom, since solutions of even 0.5 per cent. introduced into the empty stomach or the lower end

*Cannon has found indications of weak inhibitory impulses also passing along the vagus.

of the esophagus of normal individuals provoke no sensation whatever. It is evident, also, that excess of hydrochloric acid is not in itself sufficient to account for the pain in supersecretion, but that some other factor, such as abnormal sensitiveness to acid, must play a part. Regarding the effect of hydrochloric acid on gastric sensibility, the significant observation has been made that whereas 100 c.c. of water containing about nine drops of the officinal, dilute hydrochloric acid called forth no sensation in the stomach when swallowed by healthy persons, a violent pain was produced uniformly in a number of cases of gastric ulcer.

That psychic states influence digestion has been referred to already when speaking of the inhibitory effect of depressive emotions upon gastric peristalsis. Their influence is also exerted upon gastric secretion, here asserting itself through specific fibers of the vagus. Appetite and the contact of food with the mouth during mastication start the flow of gastric juice a few minutes after commencing to eat, even though no food enter the stomach. Impressions of smell and taste, whether pleasant or disagreeable, are very efficacious stimuli, whereas mere tactile sensations in the buccal mucosa are without effect. Neither does chewing tobacco or smoking a cigarette excite any secretion. The sight of food has proved adequate in experiments on dogs, but not invariably with man. Auditory impressions fail. The flow of gastric juice induced by stimuli of the kind mentioned has been variously designated as the psychic, appetite, and buccal reflex secretion. It is continuous, but exhibits periodic spurts of increase, reaches a maximum and then declines, to stop about forty-five minutes after mastication has ceased. The time of its appearance may be delayed by local fatigue probably involving the nerves of taste. The quantity of the appetite juice varies with the food. With bread, for instance, it is less abundant than with meat. Coarse food induces a more copious flow than fine. Rinsing the mouth with cognac excites only a scant flow. The appetite secretion is actively digestant and inaugurates the changes which food undergoes in the stomach. It is augmented by an additional production of gastric juice which begins twenty to thirty minutes after food has entered the stomach, and outlasts the earlier flow several hours. This supplemental secretion seems to be the outcome of direct, chemic stimulation of the mucosa by substances derived from the food. What these substances are has not yet been determined. It is known, however, that hydrochloric acid, sodium chlorid and meat ash are not concerned, but that dextrin, maltose and dextrose, proteoses and, above all, the extractives of meat play an important role in the process. They do not act upon the mucosa of the fundus, but upon that of the pyloric region and duodenum, liberating the hormone, gastrin, which is taken up by the blood and conveyed to the glands throughout the stomach, there to function as specific excitant of their secretion. As illustrating the utility of meat extractives may be mentioned that experiments on dogs have shown that solid morsels are broken up better when

fed after instead of before soup. An enema containing water or milk, sodium chlorid, dextrose and egg-yolk is capable of leading to the production of a small quantity of secretion by the stomach, pepsin and rennin being formed in about normal proportion, but the acidity averaging only 28 per cent. of the usual figure. This indicates that the mechanism of secretion can also be started, although imperfectly, from within the lower bowel.

Pure human juice, free from all other admixture, is of crystal clearness. A thick layer is slightly opalescent. Ultramicroscopic granules are present. Its specific gravity is quite variable, rising materially when food has been taken. Reaction and composition are not the same in all portions of the stomach. Hydrochloric acid is the special product of the parietal or oxyntic cells of the fundus, pyloric juice being alkaline with sodium carbonate. There is thus an anatomical explanation why cancer (according to its location) may or may not lead to absence of free hydrochloric acid. Pepsinogen, the precursor of pepsin and product of the chief cells, is of generalized origin, and disappears from the gastric secretion only in rare cases of achylia. Besides pepsin and rennin, a fat-splitting ferment has been discovered in the gastric juice. Like hydrochloric acid, it is a product of the fundus. Contrary to former opinion, lactic acid is never of gastric origin, but always derived either from the sarcolactic acid of meat or the fermentation of carbohydrate. The latter obtains when the growth of lactic acid bacilli is not inhibited by a sufficiency of free hydrochloric acid, or when slow absorption or stagnation permits them to flourish.

The percentage of hydrochloric acid in pure human juice is now known to be 0.40 to 0.55, just about double that usually given in text-books and nearly equal to the percentage in dog's juice. This corresponds to a total acidity of 110 to 140 as against the clinical normal value of 60 to 70 for siphoned gastric contents. No pathological value determined clinically after a test-meal has ever been found to exceed the normal for unmixed native juice. The percentage of hydrochloric acid in pure juice is almost constant, showing but insignificant variations with different stimuli or at different intervals of a secretory period. The absolute quantity of hydrochloric acid, however, will vary with the amount of entire juice produced. The clinical finding, "hyperchlorhydria," thus primarily indicates super-secretion, either as an independent anomaly, or consequent upon the long-continued excitation of food retained in a myasthenic stomach. Exaggerated motility might come up as a secondary consideration; for, if a considerable part of the test-meal leaves the stomach early, the less diluted juice obtained would give to the siphoned contents a higher acidity than usual. Experimentally, it has been found possible to cause a lowered percentage of hydrochloric acid by cauterizing the mucous membrane of the stomach, but only for the time the injury was being inflicted. This peculiar and isolated instance tends rather to confirm than weaken the evi-

dence that constancy in percentage of hydrochloric acid in pure gastric juice is maintained as much in the direction of decrease as of increase. Hence, the clinical finding, "hypochlorhydia," in all probability indicates either subsecretion, or partial neutralization by mucous or pus. It is worthy of note that numerous animal experiments demonstrate the possibility of diminished secretion on the part of one area of gastric mucosa being more or less compensated for by augmented activity on the part of another.

The conversion of heterologous into homologous proteids takes place in connection with their union with the hydrochloric acid of the gastric juice, the influence of pepsin not being of decisive moment. An excess of proteid or deficiency of secretion allows some proteid to escape conversion.

In contrast to the uniformity which characterizes the acidity of gastric juice, its content of ferments, notably of pepsin, is subject to variations determined by the nature of the food. Thus, in the dog, the percentage of pepsin secreted for the digestion of bread is five times as much as for milk and four times as much as for meat. An abnormal increase in the percentage of ferments is unknown, and it remains to be determined whether the pathologic decrease sometimes observed is not merely incident to a diminution or cessation of gastric secretion as a whole. The quantity of complete secretion poured forth, hence the total of acid and ferments, the proportion of the latter, as well as the tide and ebb of flow impart definite characteristics to the gastric juice. These stand to a certain extent in specific relation to diet, and recur with approximate constancy under like conditions. For example, meat juice is in general more concentrated than milk juice. For meat, the time of greatest flow and activity occurs during the first hour or two of secretion, for milk during the last. Not only the kind, but also the amount of food is a determining factor, for the quantity of secretion is nearly proportional to the size of the meal.

A consideration of the various influences which affect the work of the stomach is of great practical interest. Very vigorous muscular exertion interferes with gastric digestion. Moist, warm applications to the epigastrium as a rule, though not invariably, are favorable both to secretion and motility. Anger and depressing emotions restrict the production of gastric juice. Percentage reduction of water or of chlorine in the body fluids has the same effect. During the menstrual and the premenstrual period, the stomach displays increased secretory activity, but lessened motility. An experiment on a pregnant bitch disclosed a diminution of gastric secretion as the time of labor drew near. This was interpreted as indicating salt impoverishment of the maternal organism, and as explanatory of the instinctive eagerness for salted and acid food encountered during pregnancy. Diminished flow is a common accompaniment of anemia and jaundice, whereas the reverse is the rule in gastric ulcer.

Animal as well as vegetable fats and oils exert a marked antagonistic

influence which may, however, be overcome more or less by a strong appetite. Hence cream excites only half as much secretion as skimmed milk, and fatty cheese or meat is less stimulating than lean. The action of fat is not brought about by its contact with the mucous membrane of the stomach, but with that of the duodenum. The secretory excitation of starch, cane and grape-sugar is hardly greater than that of pure water. Sugars in quantity, especially levulose which constitutes 71 per cent. of honey, depress secretion and provoke an exosmosis of water into the stomach. A meal which combines starchy with fatty food keeps secretion low throughout gastric digestion, the production of pepsin ceasing altogether during the last hours. Meat, raw or done rare, meat soups, extracts, and juices, bread and bread-like articles of food are the most powerful excitants of gastric secretion, skimmed milk and solutions of gelatin in water ranking next. If the extractives of meat are removed in its preparation, by thorough boiling for instance, it loses its stimulating quality. On the other hand, the stimulating effect of meat can be still further increased by salting, or be prolonged by incorporating a starchy food such as rice with the dish. The finer raw meat is divided, the less the quantity and duration of gastric secretion which it excites. Egg-albumin, whether raw or cooked, can not start the supplemental flow of gastric juice unless its digestion has been set in motion by the appetite secretion or by other food-stimuli. In contrast to this inertness stands the pronounced effect of fluid yolk which not only arouses a strong response to its own excitation, but increases that to other food stuffs. Simple purees of the common vegetables are among the mildest secretory stimulants. Mustard acts very energetically. In concentrated form, it may exhaust the secreting glands, while augmenting the production of mucus. Cinnamon and cloves also are stimulating, whereas peppers, ginger, nutmeg and caraway seem to be relatively indifferent. Common salt is another excitant of gastric secretion, but only in concentrations exceeding the physiologic of 0.9 per cent. The effect rises progressively with increase in concentration from one to five per cent., irrespective of the absolute quantity of salt introduced into the stomach. Certain experimental and clinical findings indicate that solutions of about 1 per cent. sodium chlorid are better adapted for therapeutic use than those of greater strength. A glass taken half an hour before meals is an appropriate prescription against the subsecretion of anemic and weakly states with absence of organic changes. Higher concentrations than 5 per cent. are irritating. Along with an augmented flow of gastric juice, they cause an increased production of mucus which neutralizes acidity and therefore diminishes digestive power.

Water is a feeble stimulant. At least 200 c.c. are required to produce any effect whatever. Half a liter of cool water taken with a meal does not disturb digestion in health, but larger quantities may. Temperatures from 15° to 60° C. have little, if any influence, and are brought to the

level of body-heat within ten minutes. Ice-cold water taken before a meal depresses subsequent secretory activity, especially during the first hour of digestion.* Carbonated water hastens and augments secretion. It shortens the duration of gastric digestion and the time food remains in the stomach. Coffee increases secretion. This effect is not due to the caffeine, but probably to the empyreumatic substances which it contains. Fat-free cocoa acts similarly. Tea, on the contrary, induces very little flow. Alcohol is a decided excitant of gastric secretion. Its influence extends beyond the time of its own sojourn within the stomach, so that food taken subsequently calls forth a greater flow than usual. 10 to 20 per cent. alcohol also increases the production of mucus. Over 50 per cent. provokes the secretion of a large amount of mucus, but of comparatively little gastric juice. Most of the alcohols contained in fusel oil, even when much diluted, inhibit the production of gastric juice, but augment that of mucus. Beer, white wine and fermented fruit juices are somewhat more stimulating than is accounted for by their alcoholic strength. Claret is a little less stimulating than white wine.

With alcohol, the consideration of the effects on gastric secretion of articles used as food may properly terminate, and that of substances employed as drugs be begun. The numerous bitters and stomachics increase secretion both reflexly by way of the nerves of taste and smell, and directly by local excitation of the stomach. The effect, moreover, follows whether the gustatory and olfactory sensations be pleasant or disagreeable. Taken alone, the influence exerted by bitters and the like is insignificant, being brought out only in connection with the physiologic stimulus of food consumed after their administration. Too large a dose may depress secretion. Pilocarpin, opium, physostigmin and morphin excite secretion in the resting stomach and increase the quantity when active, the first two at once, the last two more slowly. A somewhat larger dose of pilocarpin seems to be required to act on the gastric than upon the salivary glands. Atropin restricts the flow of gastric juice under all circumstances. Opium as well as the alkaloids mentioned display their action whether administered by mouth or subcutaneously. Dilute solutions of hydrochloric acid do not seem to affect the normal stomach differently than an equivalent quantity of water. There is on record, however, an experiment on a dog whose stomach was in so bad a catarrhal state as to produce only an exceedingly scant amount of gastric juice of very low acidity. In this instance, the introduction into the dog's stomach of 200 c.c. of water containing the equivalent of about 8 c.c. dilute hydrochloric acid U. S. P. resulted in an energetic secretory response to food given about half an hour afterward. The improvement continued during the following day. No such influence could be secured if the hydrochloric acid was introduced after instead of before giving food.

The action of sodium bicarbonate, though very positive, is not exerted

*Some investigators attribute a slight stimulating effect to cold water.

directly upon the stomach, but reflexly from the mucous membrane of the duodenum. Administered on an empty stomach, say half an hour before a meal, or in such dose after a meal that at least part of it reaches the duodenum unchanged, it can be counted upon to check secretion. Weak solutions given during instead of before gastric digestion may have an effect just the reverse, because of the carbon dioxid generated. The same chemical explanation accounts for the abundant production of gastric juice after a dose of calcium carbonate. Any hydrochloric acid which has been secreted because of the water or food taken will attack the particles of chalk deposited in the folds of mucosa, slowly and continuously liberate carbon dioxid therefrom, and thus maintain the stimulating effect of the gas for a prolonged period. Calcined magnesia in suspension up to 5 per cent. does not influence secretion, though of course, it will neutralize acid. Neither has bismuth subnitrate up to 2½ per cent. any effect, although 5 per cent. seems to reduce secretion somewhat. The alkaline lithium salts, unlike sodium bicarbonate, are stimulating, even if taken fasting. On the other hand, sodium and magnesium sulphate resemble sodium bicarbonate in being inhibitory. Experimentally, 3 per cent. solutions proved to have a powerful influence. The statement made in regard to sodium chlorid that concentration, not absolute quantity of salt, determines the degree of action may be repeated here as equally applicable to sodium bicarbonate and other salines.

The effect of a mixture of salts antagonistic in action is dependent upon the relative concentration of the different constituents. A number of mineral waters has been studied experimentally with results which tally very satisfactorily with what might be expected from the application of this principle to their composition. Speaking generally, the simple carbonated waters of which Apollinaris is an example, and the muriated waters, such as Kissingen Rakoczy, and Homburg, increase secretion. Selters, the best known of the muriated alkaline waters is likewise stimulating. Carlsbad has much the same effect on the secretion of gastric juice as an equivalent amount of ordinary tap-water. The alkaline waters of which Vichy is the type diminish the flow of gastric juice somewhat, provided the stomach positively is empty when they are taken. In the bitter water, Friedrichshall, the stimulating and inhibitory ingredients are present in such balanced proportions that the combined effect on the stomach's secretion does not differ from plain water. The bitter water, Hunyadi Janos, however, markedly reduces the production of gastric juice.

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ANAMNESIA SYPHILITICA.

By FRANK R. FRY, A. M., M. D., of St. Louis,

Case I.—A woman of forty-two had a little psychic attack that looked very much like an incipient acute mania. After ten days in an asylum the mental state was so rapidly changed for the better as to raise in the minds of her observers the question of its cause. The patient had recently acquired a "Christian Science" tendency and objected to a physical examination. In the course of a short time, however, a careful examination was made. The pupils were slightly unequal. Their reaction to light was very sluggish. The right knee-jerk was decidedly greater than the left, while the left ankle-jerk was greater than the right. Station was not perfect and with careful tests a positive degree of general incoördination could be made out. At this time the patient was feeling very well, almost an euphoria; a little too well, everything considered. She confessed, however, that at times she felt a heavy or constricted condition about the head and with it almost a confusion, or a momentary obscuration. The husband was told that his wife had syphilis. He and she were intellectual, refined persons, and he was greatly concerned over his wife's condition. He was astounded—putting it simply. A consultation with another neurologist was suggested by us and also a Wassermann reaction. The reaction was positive. He was, by the way, impressed with this fact far more than by our diagnosis. He was told that his wife should have months of antisypilitic treatment and the method of it was explained to him. On account of her Christian Science proclivities she would not consent to this. He then made up his mind to tell her that she had lues and to explain the situation to her. He began by saying, "The doctors say you have syphilis in your system." She replied: "They are pretty good doctors. I know I was infected with syphilis." She then told her husband that her father had contracted syphilis and inoculated his wife and two young children. They were treated by physicians. The rest of the story is not essential to our purpose, although it contains an example of connubial trust that would furnish a basis for an instructive romance.

Case II.—A number of years ago a married woman about thirty years old came with her husband from a remote rural district. She had classical cerebral syphilis. In the hospital under thorough treatment she gradually recovered from her symptoms; intense cephalalgia, third nerve paralysis on one side and a hemiplegia of the opposite side, etc. This man and woman, although not unintelligent were unlettered. In an at-

tempt to lead up to the subject and inform them of the nature of her malady they seemed so utterly unsophisticated as to make it hopeless. They were people of excellent character as was learned from further acquaintance with them. She faithfully returned for examination twice within a year and the treatment was continued at home. A year or so later a practitioner passing through the city called on us. He knew this woman and her family—excellent farming people. Some years ago he had been their physician. Now he was located at some distance from them. He learned that she had been getting from us inunctions and increasing drops. He supposed we had found syphilis. He related that when quite a young girl she had been betrayed by a "lightning-rod" man or some such attractive nomad. The doctor found her aborting at three or four months. She made a good recovery. The doctor firmly believed that he and the mother and the girl remained the sole possessors of the secret—another example of human trust; and still another when he related this to us for what use we could make of it in a scientific way.

Case III.—In a neighboring smaller city the diagnosis of cerebrospinal syphilis was made in a male subject over forty years of age. Two or three medical gentlemen were present and one insisted that he had always attended the patient, and for many years had seen so much of him professionally, when ailing in any particular, that if there had ever been any syphilis in the man he would have found it. In this case it was the *ensemble* of cerebrospinal lesion and symptoms, their manner of approach and the condition of the patient from a neuropathic standpoint that impressed the diagnosis irresistibly on the neurologist's mind, a condition of affairs not to be briefly or readily conveyed in language of any kind, yet definitely grasped by the observer, well trained in this line of work.

At a later period the case was discussed in a larger group of local medical men which included a gentleman of the very highest professional standing and a close friend of this patient's physician. He made the statement that about seventeen years ago this patient got syphilis, was ashamed to go to his *own* doctor and had come to him and he had treated him for the disease.

Case IV.—Many years ago a girl of probably twenty-five years appeared with a chancre on her lip. She was told the character of it. She was an English-reared woman of intelligence and character. As delicately as possible we went about an anamnesis. She had a sweetheart to whom she was engaged. We explained that if he had no syphilis he might suspect her of immorality. She seemed to have no concern on that point. She told him what we affirmed as our diagnosis and brought him to us. He was intelligent and gentlemanly. He at once explained that some weeks previously he was "kidding" with his sweetheart and had slightly bitten her at the exact point where the lesion subsequently appeared. He was much concerned and felt himself undoubtedly responsible for the condition of the girl. We examined him then and subsequently closely

and carefully in every way, and found no sign of the disease anywhere. At the time he was in the care of two prominent surgeons for a fractured wrist. They got our statement and they overhauled him thoroughly and found nothing. A few weeks later he broke out with a syphillide, so pronounced by a competent dermatologist. Where and when was the initial lesion?

Case V.—A man of thirty years shows the right pupil slightly larger than the left and reacting sluggishly to light compared to the left. He has also a slight ptosis on the same side. His station is imperfect. His knee-jerks and ankle-jerks amount to almost a clonus. For several years past he has had attacks of increasing tabetic-like pains in the lower extremities, which have been worse in recent months. He has been in a "run down," neurasthenic state for eight or nine months, keeping at his work only with difficulty, while previous to a year ago he had felt almost no limit to his endurance (superintendent of electric construction work). He is totally impotent sexually. He never had dissipated in any way, but had always been a hard, consistent and successful worker. He was told he had syphilis. He was surprised. A Wassermann was to his mind (of scientific training) convincing. When only fifteen years of age he was induced by a girl to have intercourse with her. He was afterwards sore and a physician pronounced the lesions of no consequence. They were soon well. He knew that the girl cohabited with other persons. This was the sole history of any venereal disease in his life.

Every one who has seen a good deal of syphilis and studied any of its clinical phases carefully is impressed with the atypical possibilities of the disease. So much so in fact that he runs a risk of being impatient with those who have not had opportunities to realize the same experiences. Frequently in consultation the neurologist says: "This is syphilis." The patient's physician retorts: "I do not see how it could be possible." He has not learned that "anything is possible when it comes to syphilis." The cases related above could be matched by anyone who has closely studied syphilis clinically for a few years. These instances from one observer's experience were impressed on the writer's mind and are here presented in an effort to impress others. There has been no attempt to set forth all the symptoms in any instance; on the contrary, we have tried to be as brief as possible and yet as forcibly as possible reach the one point we have in mind in attempting to write a paper of this kind—namely, that syphilis is very often present in the absence of any history of infection or previous signs, and that even where there is a history it is so often intentionally or unintentionally lost that we can never be sure what we do or do not know in any doubtful case.

The neurologist, more than any other class of practitioners, meets "obscure" syphilitic cases, the cases of so-called "masked syphilis," in which nothing has been remarked until the symptoms of syphilis of the nervous system appear. He becomes so accustomed to no history of

syphilis in the presence of syphilis that he really grows careless on the question of luetic anamnesis; an indifference which his confrères cannot always understand because they do not always grasp the symptomatology that convinces the neurologist of syphilis. In fact it is a considerable task to attain proficiency of this kind. The importance of it has not been recognized as it should be. At this point the Wassermann sero-reaction would seem to come to our rescue. We have often seen a neurological diagnosis of syphilis vindicated by the presence of this test, where in the eyes of the diagnostician it needed no such confirmation; and yet it was satisfactory to have others convinced. It must not be lost sight of, however, that certain neuropathic syndromes are far better evidence of syphilis of the nervous system than is the serum test. A syphilitic subject, for example, may have a skin eruption that is not a syphilid. He may have a well-defined disease of his nervous system that is not syphilitic. Hence the warning not to let the blood-test convince us of too much. And on the other hand the absence of the Wassermann reaction does not always mean that the patient is free from lues.

Humboldt Building.

MEDICAL AND SURGICAL PROGRESS.

ACUTE ANTERIOR POLIOMYELITIS.*

A REVIEW OF RECENT LITERATURE.

By ALFRED FRIEDLANDER, M. D.

1. EPIDEMIC OF SEVENTEEN CASES OF POLIOMYELITIS.—Armstrong (*Pediatrics*, August, 1910).
2. OBSERVATIONS ON POLIOMYELITIS.—Coulter (*Pediatrics*, August, 1910).
3. A POSSIBLE SECOND ATTACK OF ACUTE POLIOMYELITIS IN THE SAME PATIENT.—Eshner (*Med. Record*, September 24, 1910).
4. THE CONTRIBUTION OF EXPERIMENTAL TO HUMAN POLIOMYELITIS.—Flexner (*Arch. of Ped.*, July, 1910; *Jour. Amer. Med. Assoc.*, September 24, 1910).
5. EXPERIMENTAL POLIOMYELITIS.—Flexner and Lewis (*Jour. Amer. Med. Assoc.*, November 13th, December 4th, December 18th, 1909, January 1st, February 12th, April 2d, May 28th, 1910).
6. INFANTILE PARALYSIS IN ONE MASSACHUSETTS DISTRICT.—Jones (*Bulletin of the Mass. State Board of Health*, June, 1910).
7. TREATMENT OF ONSET OF ACUTE POLIOMYELITIS.—Kerr (*Long Island Med. Jour.*, November, 1909).
8. INFANTILE PARALYSIS IN MASSACHUSETTS IN 1909.—Lovett (*Bulletin of the Mass. State Board of Health*, June, 1910).
9. EARLY DIAGNOSIS OF POLIOMYELITIS.—Lucas (*Ibid.*).
10. NEBRASKA EPIDEMIC OF POLIOMYELITIS.—McClanahan (*Jour. Amer. Med. Assoc.*, October 1, 1910).
11. POLIOMYELITIS, 1910.—New York Report.
12. PATHOLOGY AND BACTERIOLOGY OF ACUTE POLIOMYELITIS.—Robertson and Chesley (*Jour. Amer. Med. Assoc.*, September 17th, 1910).
13. PATHOLOGY OF ACUTE POLIOMYELITIS.—Strauss (*Pediatrics*, August, 1910).
14. U. S. Census Bulletin, September 24th, 1910.
15. VIENNA AND AUSTRIAN EPIDEMIC OF 1908.—Zappert (*Jahrbuch f. Kinderheilk.*, July 1st, 1910).

Incidence.—There is a general impression that poliomyelitis is becoming more frequent, that the morbidity has increased in various parts of the world in the past few years. There can, of course, be no doubt that the disease has been called to the attention of the profession very much more

*A full bibliography of recent literature up to April, 1910, will be found on pp. 34-5 of the *Bulletin of the Mass. State Board of Health* for June, 1910.

of late, and that it is more frequently recognized than it was formerly. But bearing this caution in mind, the following table is at least very suggestive:

Period	Cases	Outbreaks	Average Number of Cases
1880-84.	23	2	11.5
1885-89.	93	7	13.0
1890-94.	151	4	38.0
1895-99.	345	23	15.0
1900-04.	349	9	39.0
1905-09.	8054	25	322.0

The recent outbreaks have been widely distributed. The largest epidemic ever reported was the New York one of 1907—2500 cases. The data concerning this epidemic have just been published and are now available for study.

Flexner has called attention to the significant fact that the original foci of the epidemic disease in the United States, occurring in the summer of 1907, were along the Atlantic Seaboard, New York and Boston being most affected. These ports receive the immigration from Northern and Eastern Europe. Since, moreover, the best established focus for the disease in Europe during the past decade has been Scandinavia, it further becomes significant that the second large outbreak in our country has occurred in that part of the Middle West which receives a large influx of population from Norway and Sweden.

Etiology.—Most cases occur in the summer months and in early autumn. The ages of greatest susceptibility would seem to be from the second to the fourth year. Older children are not exempt, and adults are not infrequently attacked. The experiments of Landsteiner and Popper, followed by the brilliant work of Flexner and Lewis in this country, have demonstrated absolutely that the virus of poliomyelitis is a living thing. Flexner and Lewis have now transmitted the disease through twenty generations of monkeys, obtaining a virus that is now more active than it was at the beginning. The original inoculation was made from a portion of the cord of a child, dying of the disease, into the cranial cavity of the ape.

The virus belongs to the class of so-called filterable viruses; that is to say, viruses of ultramicroscopic size, so small that they cannot be revealed by the most powerful microscope. The virus passes unchanged through the finest filter of which we have any knowledge. It may be noted here that the viruses of yellow fever (at one stage), of dengue, and of rabies, all belong to the class of so-called filterable viruses. So far, actual cultivation of the virus outside the body has not been successful. Changes in culture-fluids, indicating increase in potency of virus have been obtained, but it has not been possible to transmit the disease by means of such fluids.

It would seem that the virus does not stand artificial conditions of growth very well, but is adapted only for a parasitic mode of existence.

Communicability.—In the writings of the last year there is little dissent from the opinion that the disease is communicable. Direct transmission is apparently frequent, transmission by means of a healthy carrier is more than probable, and infection occasionally appears to remain in a house where the disease had previously existed. On the other hand, the direct contagiousness of the disease is apparently not very great, according to the report of the Massachusetts Committee.

Armstrong concludes that contact infection is probable, mediate contagion possible. With reference to the "degree" of contagiousity, Emerson's study of the Deerfield Valley epidemic is of great interest. There were 67 cases. There were one hundred and sixty-six other children in the families of those affected, and eighty-six other children were known to be in intimate contact with the sixty-seven. Of these two hundred and fifty-two, four later developed the disease.

Of recent writers Zappert alone appears to hold that there is not much evidence of contagiousity.

Experimental Transmissibility.—The most brilliant work in this field has been done by Flexner and Lewis, who have up to this time succeeded in carrying the disease through over twenty generations of monkeys. Experimental transmission to other animals has failed except that Krause and Meinecke have succeeded in inoculating rabbits. In monkeys the disease may be produced by intracerebral, intraperitoneal, subdural, intraneural, perineural, and subcutaneous injections. The disease has been caused by the introduction of the virus into the stomach by means of a catheter, and by scarifying the nasal mucous membrane and rubbing the virus into the injured membrane.

The disease in monkeys presents the clinical aspects of the human disease, except that the experimental disease in monkeys is much more fatal. Indeed in Flexner and Lewis's later series the mortality has been 100 per cent. Flexner is inclined to place great stress upon the intranasal method as the channel of infection in the human being, the connection with the brain being thus most easily established. All investigators are agreed that the intracranial route is the best for experimental inoculation, and the practical importance of this special phase of Flexner and Lewis's work is thus easily understood.

With reference to the virus itself it may be added that the virulence of an emulsion is not impaired by drying (seven days, Flexner), by freezing, or by suspension in glycerine, but it is injured by an exposure of 45°-50° C.

Pathology.—The most important work in the pathology of the disease of late is that of Strauss. A summary of his findings, partly as published by him in the article referred to and partly as abstracted by Coulter, follows:—

The inflammation of the cord is always accompanied by inflammation of the pia mater and the arachnoid. This is a round-celled, probably lymphocytic, infiltration, such as occurs in rabies and syphilis, but not in diseases of bacterial origin. This pial infiltration is an essential element in the pathological process. The meningitis is most marked in the lumbar and sacral regions of the cord, next in the cervical. It is of greatest intensity over the anterior surfaces of the cord, whence it follows the pia into the depths of the anterior fossa and along the sheaths of the vessels. The posterior root fibres and the arachnoid covering the spinal ganglia are likewise infiltrated. This inflammation of the pia and arachnoid, together with that of the ganglia, is the factor responsible for the irritative symptoms in various parts of the body.

The pathological process in the cord is primarily dependent upon vascular change; secondarily, upon changes in the cells. The changes in the parenchymatous tissue are secondary to those in the interstitial tissue. The ganglion cells are affected only secondarily, and only when in contact with the inflammatory process around the vessels. The interstitial process is dependent upon its relation to the vessels for its character and

localization. Next in importance to this hyperemia (and equally characteristic of rabies and syphilis) is the perivascular infiltration. The inflammatory edema is present throughout the cord, even being noteworthy macroscopically by the moist appearance of the cut surface of the cord. This inflammatory edema doubtless plays an important part in the production of the paralysis and explains to a large extent the transitory nature of the symptoms in the cases which survive. It is now firmly established that the pathological process in acute poliomyelitis is primarily dependent upon vascular and interstitial tissue changes, and that the ganglion cells are only secondarily affected. The ganglion cells most affected are those in the anterior horns of the lumbosacral and cervical enlargements of the cord, but the process is not limited to anterior horn cells. (Hence it is now said that the title, "anterior" poliomyelitis, is a misnomer.) The degenerated ganglion cells always lie in an area of marked infiltration, but the converse is not true, for normal ganglion cells are often found in infiltrated areas. Involvement of medulla, pons, and basal ganglia always occurs in fatal cases, though clinical experience has shown that such involvement does not necessarily mean a fatal prognosis. The brain cortex may show evidence of vascular irritation or even cellular infiltration. The similarity of the pathological process to that of rabies has led some to the conclusion that there may be a similarity of virus in the two conditions. Another suggestive point of similarity in the two diseases lies in the mode of experimental inoculation common to both.

The internal organs exhibit the changes that are to be expected in an infectious disease: cloudy swelling and parenchymatous degeneration. The marked involvement of the solitary follicles of the intestine and Peyer's patches, together with the common initial history of anorexia, vomiting and diarrhea suggests the possibility that the gastro-enteric tract may be one port of entrance of the virus. The rapid disappearance of extensive paralysis is probably due to subsidence of the acute edema which had interfered with conductivity of the nerve-fibres. Furthermore many of the cells at any one level are either not at all, or else only very slightly, affected; hence, restitution of function is rapid.

Modes of Infection.—As before stated it has been shown experimentally that the disease can be transmitted through a variety of portals. In his most recently published article, Flexner specifically calls attention to the fact that the nasopharynx is the location in the body to be regarded with especial suspicion as being the port of entry of the virus. Here again there would appear to be a marked similarity between poliomyelitis and epidemic meningitis. Flexner is also disposed to the view that the nasal mucosa serves not only as the port of infection, but also as the path of elimination of the virus into external nature, since such elimination must occur in order that the virus be maintained alive and transmissible. Experimental work has done much to substantiate this view.

Immunity.—It is well known that a second attack of poliomyelitis is rarely suffered by one individual. (But second attacks do occur as in a case recently reported by Eshner.) It has also been established (largely through Flexner's work) that an undoubted and even high degree of immunity to infection with the virus of poliomyelitis is obtainable in animals and probably equally in human beings. It is, of course, only natural that speculation should be rife as to the possibility of producing a therapeutic serum and, as a matter of fact, experimentation in this line is most active just now. Flexner's latest word with reference to this

question is as follows: "The serum treatment of poliomyelitis must at the present time be regarded as strictly in the experimental state, and it cannot be predicted how soon, or whether even at all, such a form of specific treatment of the disease will be applicable to the spontaneous epidemic disease in human beings."

Symptomatology.—As to incubation there is much difference of opinion. That the incubation period may vary widely would seem certain. From various reports it would appear that the extremes run from five to thirty-three days, with an average of ten days.

Clinical Types.—The classification of Wickman is now generally accepted as follows, there being eight forms:—

- (1) *Spinal poliomyelitic form*, the common textbook form.
- (2) *Ascending form*. In this form the paralysis ascends, perhaps to the thorax, often causing death by involvement of respiration. Many cases of so-called Landry's paralysis are covered by this form, which is the most fatal of all types.
- (3) *The bulbar or pontine form* with involvement of cranial nerves and of the throat and larynx. This type may exist alone or in combination with paralysis of extremities.
- (4) *Cerebral or encephalitic form*.
- (5) *Ataxic form*.
- (6) *Polynuritic form*, where the diagnosis is often very difficult.
- (7) *Meningitic form*, which resembles a meningitis from which, however, it can be differentiated.

(8) *Abortive form*. In recent times it has been recognized that especially during epidemics, very mild cases, several often occurring in one family, may occur. Fever, headache, stiffness of neck and general disturbance are present. But the paralysis is slight and transitory or does not occur at all. This form is, however, of great clinical importance as forming a probable link in the transmissibility of the disease. From a study of 147 such cases, Wickman finds four sub-types: (a) general infection, (b) meningeal irritation, (c) cases with much pain, like influenza, (d) cases with marked digestive disturbance.

Much difference of opinion exists among recent writers as to the prodromal and early symptoms. The New York investigation of the prodromal symptoms agrees completely with the early symptoms found in experimentation. Restlessness and irritability are marked and occur early. Headache, general or frontal, is frequently complained of by children old enough to localize, and this is most often accompanied by stiffness of the neck. If with these symptoms, there should be trouble in the upper air-passages (coryza, bronchitis), suspicion should at once be aroused. Fever, though always present, is not typical and is of little use as a guide. A tendency to profuse sweating, marked hyperesthesia and sensitiveness to movements has been noted by some observers. Anorexia, nausea and vomiting may occur. The bowels are constipated in some cases, while in others severe diarrhea occurs. At times delirium and convulsions usher in the disease.

Leucopenia has been noted by many observers as a constant find early in the disease. Coincident with the drop in the total number of white cells, Lucas has found a fairly constant lymphocytosis, the lymphocytes running up to 40 per cent.

In the early stages the cerebrospinal fluid also shows marked changes, the most noteworthy factor being a great increase in the number of cellular elements, very largely of the large mononuclear type. Later in the disease polymorphonuclear cells again appear.

The later symptoms depend, of course, upon the form of the disease existing and need no further comment here.

Diagnosis.—Now that the abortive form is recognized the importance of making the diagnosis early becomes more manifest than ever, particularly in view of the evident contagious character of the disease. Absolutely definite diagnostic criteria unfortunately do not exist, but the presence of nervous symptoms, with fever, catarrhal conditions in upper air-passages, and digestive disturbances should arouse suspicion. Lumbar puncture and the blood-picture will aid in early diagnosis. With the onset of definite paralysis the diagnosis is usually easy.

Prognosis.—The mortality in 628 cases collected in Massachusetts in 1909 was 8 per cent., which represents about the general average. Of these 628 carefully studied cases, 62 (10.8 per cent.) made a complete recovery without lasting paralysis. It is of interest to note from a special United States Census Bulletin issued September 24th, 1910, that in 1909 there were 569 deaths in the registration area of the United States, this area comprising something over 55 per cent. of the total population. Of the 569 deaths, 552 were in white, only 17 in colored persons. In this bulletin, anterior poliomyelitis is now officially described as an "acute infectious disease."

Treatment.—Prophylaxis is of the utmost importance and universally now during the presence of epidemics strict quarantine is insisted upon. Massachusetts has made the disease a notifiable one. The State Board suggests that urine, stools, and sputum should be disinfected.

Flexner and Lewis report that a 1 per cent. solution of peroxide of hydrogen in perhydrol has been found to destroy the virus. In view of their belief that entrance of the virus is probably by the respiratory tract, the use of a nasal douche of this sort would seem advisable. Special house to house inspection during epidemics, as practised this past year in Massachusetts would also seem of prophylactic importance. The special remedial measures generally recommended include rest, hot bathing, sedatives, and internal antiseptics such as urotropin. (It will be remembered that urotropin given internally finds its way into the spinal canal very quickly.) It is demonstrable that drugs of this class are to be found after administration in the blood, in the tissues and in some of the excreta. Their early and free use is thus advisable. Nerve stimulants such as strychnia are not advisable in the early stages.

Kerr advises the use of hot packs, free use of water internally, hot enemata followed by castor oil, rest, restriction of diet, ergot and belladonna in full doses.

The importance of early attention to the paralysis in the way of corrective splints, or by appropriate movements is everywhere noted.

GASTRO-INTESTINAL SYPHILIS.

A REVIEW OF RECENT LITERATURE.

By JESSE S. MYER, M. D.

1. SYPHILIS OF THE STOMACH.—Curtis (*Jour. Amer. Med. Assoc.*, April 10, 1909).
2. SYPHILIS OF THE STOMACH.—Einhorn (*Arch. f. Verdauungskr.*, VI., p. 150).
3. INTESTINAL SYPHILIS.—Hueter (*Muench. med. Wochenschr.*, No. 6, 1906).
4. TERTIARY SYPHILIS OF THE SMALL INTESTINE.—Fraenkel (*Muench. med. Wochenschr.*, July, 1901).
5. SYPHILIS OF THE STOMACH AND INTESTINES.—Kohn (*Amer. Jour. Med. Sciences*, May, 1909).
6. SYPHILIS OF THE STOMACH.—Morgan (*American Medicine*, June, 1906).
7. SYPHILITIC DISEASE OF THE STOMACH AND LIVER.—Rudnitzki (*Arch. f. Verdauungskr.*, XV., 1909).

"Syphilis of the internal viscera is not nearly as infrequent an occurrence as is still commonly supposed." Although we come upon this statement very frequently in the more recent writers and experienced observers, the thought which it is meant to convey does not seem to have penetrated very deeply into our practice of medicine, and this is especially so when applied to the gastro-intestinal tract. Syphilis of the stomach, for instance, though it is not mentioned in most textbooks, is a well-recognized nosological form. A number of articles upon the subject have appeared in the past ten years; most of them, however, being little more than case reports. Previous to 1892 the Surgeon General's Library refers to only 6 cases.

The course of the disease in the gastro-intestinal tract is quite chronic, and according to Einhorn the therapy consists chiefly in the administration of potassium iodide. On the other hand Dieulafoy gives mercury the place of first importance. If we may judge by the experience of various authors, syphilis of the stomach is most often mistaken for carcinoma. This, however, may be only apparently the case, for there may be other than tumorous gastric disease due to syphilis,—such as ulcer and chronic gastritis,—the true nature of which is never suspected, which runs a chronic course, and which is never subjected to specific therapy. How frequent such cases are must be determined by future observation after the knowledge of the possibility of such disease is more generally diffused than at present.

The gastro-intestinal lesions of syphilis belong to the tertiary stage. The dyspeptic symptoms of the secondary stage must be interpreted as

systemic and not as due to any active lesion of the digestive tract. The lesions of the tertiary stage, which have received recognition, are erosion, ulcer, tumor, and scar-formation of syphilitic origin leading to pyloric stenosis. These conditions give rise to symptoms which, according to Einhorn, differ in no way from those caused by similar lesions, but due to other agencies. The correct diagnosis depends upon the history of infection, concomitant syphilitic lesions in other parts of the body, and the therapeutic test. He believes that gastro-intestinal syphilis is by no means infrequent. Morgan also decides that there are no characteristic symptoms of gastric syphilis. A considerable proportion of the cases are of a pseudo-cancerous type, but the cachexia is not so extreme. Kohn agrees with these views, but calls attention to the fact mentioned by Zeissel, who has noted that the stomach-tube easily produces hemorrhage which is often profuse, if there is a luetic condition in the stomach. Few cases of intestinal syphilis are mentioned in the literature.

Hueter reports a case which came to autopsy. There was a suggestive luetic history some years before. The rectum showed a large ulcerative surface with a clean base and sharp border somewhat raised and ring-formed. There were also several smaller ulcers present in the rectum. Beginning at the cecum and extending up $1\frac{1}{2}$ m. into the small intestine were multiple ring-formed, hard, contracted scars causing a thickening of the serosa, but no adhesions. Besides these scars there were sixteen ulcerations found in the area, one group of which caused a decided narrowing of the lumen. Tuberculosis was ruled out by the pathological examination. The veins showed a typical syphilitic productive endophlebitis.

Fraenkel reports a case of stenosis of the jejunum coming to operation. The specimen removed showed a gummatous condition in the intestinal wall with ulcerations of the mucosa. In the conclusions from this case he goes so far as to advise that in patients, especially if they be young, with stenotic conditions of the small intestine, where tuberculosis may be excluded, a history of lues should be most carefully sought and the therapeutic test employed.

Kohn reports a case of intestinal syphilis in a man of thirty-eight giving a history of initial infection fifteen years previous. During three years before coming to observation he suffered from intractable diarrhea, fifteen movements a day. The stools were thin and watery and contained blood and pus. Deep palpation over the sigmoid showed exquisite tenderness. The sigmoidoscope showed no ulceration. Vigorous antiluetic treatment resulted in an early recovery. The author warns against attributing to syphilis the digestive disturbances produced by the iodides and mercury, and believes that in stomach cases of syphilitic nature, mercury should be given hypodermically or intramuscularly, and the iodides per rectum.

The reports of cases of gastric syphilis are very much alike. A few of them are cited to show the main characteristics which they exhibit, and how exactly the case history would fit a malignant disease of the stomach. Curtis reports the case of a woman, aged thirty, with a suggestive luetic history, whose stomach trouble began one and a half years before coming under observation, with pain after meals and later on vomiting. Two weeks before entering the hospital she had vomited a half cupful of blood. Physical examination showed an applesized mass on the anterior surface of the stomach. Free hydrochloric acid absent. A diagnosis of carcinoma was made. At operation the stomach showed,

on the anterior surface near the pylorus and posteriorly near the pancreas, a tumor like thickening of the wall. A gastrectomy was done. The microscopical examination showed these thickenings to be gummata, some of which were ulcerated. No spirochætae were found. The entire stomach wall was thickened; the mucosa thrown into folds and mammilated.

Morgan reports a case of a man, who had severe, progressive symptoms for four years. There was pain in the epigastrium uninfluenced by the ingestion of food, which was at its worst at night. He suffered from obstinate constipation. He had lost thirty-five pounds in eighteen months, was extremely weak, and markedly anemic. The stomach-contents showed marked retention and an absence of hydrochloric acid and pepsin, but no tumor could be felt at first. A little later a pyloric tumor was made out and the stomach became much dilated. Potassium iodide was given and in two weeks a marvelous change had taken place, the patient having gained more than ten pounds in weight, and eventually returned to perfect health.

Rudnitzki's patient was a man of fifty-four, who had been sick for eighteen years, but whose symptoms had been worse in the past three years, especially in the spring. He complained of pains coming on an hour after meals and lasting for about three hours. He had been treated for a long time without benefit. Physical examination showed a decided loss of weight, but no cachexia and no glandular enlargement. The epigastrium was very painful to pressure and palpation revealed a tumefaction, whose lower border formed a semicircular line, the right arm of which extended to the insertion of the eighth and ninth rib, while the left arm reached up and was lost in the left hypochondrium. The lowest point of the curve reached 4 cm. below the xiphoid. The tenderness on pressure was confined to the tumor area. The tumor did not move on respiration. The localized contour and the findings on percussion all gave evidence that the tumor was of the stomach. With the exception of a considerable diminution of dullness in the right apex of the lung, the physical examination showed nothing very significant. The diagnosis of tuberculosis being highly improbable and a suspicious luetic history having been elicited, the patient was put on specific treatment. In ten days the symptom—pain after eating—was much less. The stomach tumor had diminished somewhat in size, although still decidedly sensitive to pressure. The signs in the lungs also became less. After twenty-eight intramuscular injections and inunctions the following condition existed: Absence of any pain, or resistance in the epigastrium. Patient had gained twelve pounds in weight. Feels well. In the following year had not a single stomach complaint.

It may be concluded from a review of these reports that in every case of ulcer or tumor of the stomach, or in cases showing symptoms pointing to either diagnosis, a careful history should be taken. If a definite previous luetic history is obtained, an antiluetic treatment should be instituted at once, provided temporizing does not place the patient's life in jeopardy. In case of doubtful tumors of the stomach not obstructing the cardia or the pylorus, whether giving a luetic history or not, an anti-luetic treatment might well be instituted for a short time, at least.

NON-SUPPURATIVE ETHMOIDITIS.

A REVIEW OF RECENT LITERATURE.

By W. B. CHAMBERLIN, M. D.

1. NON-SUPPURATIVE ETHMOIDITIS (unpublished).—Marquis.
2. A DISCUSSION OF THE VARIOUS INFLAMMATIONS OF THE ETHMOID BONE AS ADVANCED BY UFFENORDE.—Skillern (*Annals of Otology, Rhinology and Laryngology*, March, 1910).
3. THE COMPARATIVE PATHOLOGY OF HYPERPLASTIC AND SUPPURATIVE ETHMOIDITIS.—Skillern (Read before the Rhinological Section at the Meeting of the Amer. Med. Assoc., St. Louis, 1910).
4. DIE ERKRANKUNG DES SIEBBEINS.—Uffenorde.

Anatomy and Pathology.—Uffenorde by his investigations, which he based upon anatomical and pathological findings, as well as upon clinical observation, first established the ethmoid labyrinth as having a pathology peculiarly its own. The results of these investigations he published in 1907. Before this time the ethmoid was looked upon similarly to the other accessory sinuses of the nose. Uffenorde compared the ethmoid to a sponge, regarding the remaining sinuses as true cavities. Viewed in this light it was found to be subject to diseases differing from those of the remaining sinuses. Hajek had already demonstrated that in the middle turbinal the periosteum extended down into the medullary bone spaces, joining the endostium and forming thereby an anatomical unit. Uffenorde divides the diseases of the ethmoid into:—

- (1) Acute inflammation.
- (2) Chronic inflammation.
 - (a) Ethmoiditis, hyperplastica cum polyposis.
 - (b) Ethmoiditis suppurativa.

Situated as it were at the gateway of the remaining sinuses of the nose, the ethmoid labyrinth occupies a peculiar and interesting anatomical position. The etiology of suppurative ethmoiditis has long been understood, but according to Uffenorde by far the most important, interesting and least recognized of the diseases to which the ethmoid is subject is ethmoiditis hyperplastica. It is due to exposure, frequently repeated attacks of coryza, influenza, continued breathing of dust-laden air, etc.

The mucous membrane of the ethmoid, as well as that of the middle turbinal, is loosely attached to the underlying bone, and is peculiarly tender and susceptible. It is very thin and grayish-red in color; that on the septal side of the middle turbinal being easily differentiated from the mucous membrane on the outer side of the middle turbinal. Infection travels through this delicate membrane by continuity and with utter disregard for the cell ostia; not by the infection of successive cells contaminated with purulent secretion. With the suppurative form true

ethmoiditis hyperplastica has little and may have nothing to do. As the result of long continued noxae and successive attacks of inflammation the mucous membrane becomes at first edematous and later polypoid in character. This polypoid hypertrophy is the precursor of true polyp formation. The basal cells of the ethmoid labyrinth being most exposed to toxic influence naturally are the first to yield to polypoid degeneration. Mucous membrane, as well as periosteum becomes successively involved, while necrosis of the delicate bony framework is but a further stage of the same process.

As is well known mucous polypi always grow along the line of least resistance. If the middle turbinal, as is not unusual, lies in almost immediate contact with the bulla ethmoidalis, this line of least resistance may be throughout the entire body of the ethmoid capsule. The usual nasal examination would accordingly give no idea of the existence of the polyposis for by such an examination no polypi would be visible. Uffenorde, Marquis, and Skillern have all demonstrated clinically that polyposis of the ethmoid can exist without empyema and vice versa, while Skillern has further corroborated these findings microscopically. According to the latter the microscopic differences are as follows:

HYPERPLASTIC TYPE.	SUPPURATIVE TYPE.
(1) Metaplasia of ciliated epithelium into squamous only when parts have come into contact with other structures.	(1) General metaplasia when secretion has come into contact with mucous membrane.
(2) Meshes of subepithelial tissue dilated.	(2) Subepithelial connective tissue shows fibrous formation.
(3) Round-cell infiltration scanty.	(3) Round-cell infiltration well marked.
(4) Glands hypertrophied primarily.	(4) Glands primarily atrophied.
(5) Reabsorptive changes in bone predominate.	(5) Apposition of bone predominates.

Symptoms.—These are distinct, and, according to the observers, differentiating. Among the first in importance may be mentioned a profuse watery secretion and headache. The secretion leaves no stain upon the handkerchief. The headache may be intense, associated with boring and burning pain at the base of the nose and radiating to the supra-orbital, parietal and temporal regions. Trifacial or supra-orbital neuralgia is often diagnosed. In one of Marquis' cases the supra-orbital nerve had been resected by a prominent surgeon. Fulness in the eyeballs associated with pain on reading, spots in the visual field and increased tear secretion are common, while perversions of smell or complete anosmia are not infrequent. Such patients catch cold easily and are subject to asthma, pharyngitis, laryngitis, and catarrhal otitis. The openings of the nose are often excoriated from the profuse discharge. Frequent sneezing is often complained of.

According to Skillern the eye-symptoms are usually of mechanical origin and consist in:—

- (1) Interference with the mobility of the bulb;
- (2) irritation of the optic nerve through pressure;
- (3) changing the refraction of the bulb;
- (4) disturbance of physiological lachrymation (epiphora).

Diagnosis.—Marquis believes the diagnosis is easy if we bear in mind the foregoing symptoms and examine carefully with the Killian speculum and nasal probe. If the mucous membrane on the outer wall of the middle turbinal is thick and edematous it is almost pathognomonic of ethmoiditis. In case the middle meatus cannot be observed on account of a closely approximating middle turbinal, thoroughly cocaineize and fracture the middle turbinal at its base. Often small polypi will immediately be seen. Marquis considers the removal of the middle turbinal in most cases as unwarranted, since the fracturing of the turbinal at its base affords an excellent view of the field.

Skillern sums up the differential diagnosis as follows:

CHRONIC HYPERTROPHIC ETHMOIDITIS.	CHRONIC PURULENT ETHMOIDITIS.
(1) Secretion clear and watery.	(1) Secretion purulent.
(2) Inferior turbinal hypertrophied.	(2) Inferior turbinal atrophied.
(3) Never crust formation.	(3) Always crust formation.
(4) Headache most prominent symptom.	(4) Headache often slight or absent.
(5) Ophthalmic symptoms due to pressure of hypertrophied mucous membrane on vessels.	(5) Ophthalmic manifestations due to infection from purulent secretion.
(6) Gastric disturbances absent.	(6) Gastric disturbances frequent.
(7) Neurasthenic symptoms predominate.	(7) Neurasthenic symptoms not marked if flow of secretion is free.

Treatment.—If normal the middle turbinal should be fractured at its base by means of the Killian speculum in order to render the ethmoid capsule accessible. If diseased the turbinal should be removed in whole or in part. Marquis believes that many turbinals are sacrificed unnecessarily and that they should be retained if possible. Through the increased space, by means of the Uffenorde double curette forceps, the ethmoid is attacked and removed cell by cell until normal tissue is encountered. There is no danger in the operation if the field is kept clearly in view; if it is examined frequently with the probe; and if no cutting or scraping is done in the dark. The results of the operation are often brilliant.

Conclusions.—(1) Hyperplastic ethmoiditis can exist without pus.

(2) There may be no physical signs except the thickened mucous membrane on the outer wall of the middle turbinal.

(3) When this condition, together with the subjective symptoms, exists, it is an indication for opening the ethmoid.

(4) Unless diseased the middle turbinal should not be sacrificed but fractured at its base.

(5) Removal of the contents of the ethmoid labyrinth should only be practised under full vision and controlled by the nasal sound.

THE PRESENT STATUS OF TUBERCULIN THERAPY IN OPHTHALMOLOGY.

A REVIEW OF RECENT LITERATURE.

By JOHN GREEN, JR., M. D.

1. ON TUBERCULIN TREATMENT OF THE EYE.—Junius (*Zeitschr. f. Augenheilk.*, May, 1909).
2. A CASE OF CONGLOMERATE TUBERCLE OF THE IRIS CURED BY BACILLUS EMULSION.—Horrticker (*Zeitschr. f. Augenheilk.*, May, 1909).
3. A CASE OF SOLITARY TUBERCLE OF THE RETINA, CHOROID, AND OPTIC NERVE CURED BY BACILLUS-EMULSION.—Scheuermann (*Zeitschr. f. Augenheilk.*, July, 1909).
4. REMARKS ON THE TUBERCULIN TREATMENT OF THE EYE.—Junius (*Ophthalmology*, January, 1910).
5. AN EXPERIMENTAL TRIAL OF OCULAR TUBERCULIN THERAPY.—Rollet and Aurand (*Rev. Générale d'Ophthalmologie*, January 31, 1910).
6. ON THE USE OF WRIGHT'S OPSONIN-TECHNIQUE IN OPHTHALMOLOGY, ESPECIALLY IN TUBERCULOUS DISEASES OF THE EYE.—Stock (*Klin. Monatsbl. f. Augenheilk.*, November, 1909).

Since the appearance of v. Hippel's paper (v. Graefe's Archiv, 1904, Bd. LIX., 1), on the tuberculin treatment of ocular tuberculosis, the method has received general acceptance at the hands of ophthalmologists throughout the world. The nature of ocular tuberculosis, thanks to research and clinical experience, is being better and better understood (1). As a rule the primary focus is in the lungs, but is very frequently undiscoverable owing to the absence of fever and physical signs. Recognition of the fact that the disease in the eye is not (except in rare instances) primary, has led to the abandonment of enucleation, which formerly was generally resorted to in the (mistaken) expectation of preventing general dissemination.

There are two types of ocular tuberculosis: the benign and the malignant. Cases of the former frequently recover under ordinary non-specific therapeutic methods (fresh air, nourishing food, rest, etc., combined with appropriate local treatment). The malignant cases are often associated with general tuberculosis, and it is in these that the most striking effects of tuberculin are observed.

According to Sahli, the most that we can expect to attain by tuberculin injections is an immunity to toxins. Old tuberculin provides a tuberculo-toxin which is necessary to confer toxin-immunity. It may be used in afebrile patients. New tuberculin and bacillus-emulsion contain disorganized bacilli "in order to confer a problematic immunity to tubercle" (not yet attained in the human), and may be given to febrile

patients. The question as to the relative efficacy of the mild (reactionless) and the vigorous (reaction) methods is still *sub judice*, with present tendencies favoring the former.

Horricker (2) relates the case of a child, aged seven, suffering from tuberculous disease of the knee and tibia, who developed a grey nodular tumor of the lower half of the iris. During a vigorous mercury inunction course, of four weeks' duration, the tumor grew until it occupied three quarters of the anterior chamber. After forty-three injections of bacillus-emulsion, spread over eight months, "the tumor had vanished," and the vision was 3/60, later 5/30 and Snellen 1.5.

The following case is related by Scheuermann (3): A married woman, aged thirty-six, presented a unilateral parenchymatous keratitis with deposits on Descemet's membrane. To the nasal side of the papilla was a greyish-white patch of choroidal inflammation, surrounded by "drusen" suspended in the vitreous immediately in front of the retina. To the ocular picture were added severe headache, left facial paresis, exaggerated reflexes of the right lower extremity, and slowing of the pulse. A bacillus-emulsion course of two months' duration resulted in the disappearance of the nervous symptoms. A year later all ocular signs had disappeared (save for a quiescent white patch at the site of the choroidal inflammation) with $V=5/5$.

The tubercular deposit in the pontine region is believed to have reached the eye by way of the intervaginal spaces along the optic nerve.

Junius (4) states that "the correct application of tuberculin is an art which must be learned." There is no absolutely "best" tuberculin, though tuberculin (T. R.) is more manageable. Better still is Beraneck's tuberculin, the action of which is mild and easy of regulation. Injection should be made not more often than twice a week. In children the cure should commence with an initial dose of 1/20 c.cm. of Beraneck's solution A 128. In adults 1/20 c. cm. of Beraneck's solution A 32. The dose should be slowly increased.

Rollet and Aurand (5) inoculated the anterior chamber of rabbits with tuberculosis culture and then tested the therapeutic action of bacillus-emulsion in various standard dilutions. They conclude that (1) slowly progressive injections of B. E. are not injurious to the rabbit; (2) the temperature reactions to the maximum dose, at first *nil*, appear only after a month of treatment, and remain always very variable in spite of the identity of the dose; (3) the temperature reactions are proportional to the virulence of the tuberculosis rather than to the quantity of tuberculin injected; (4) the temperature reactions increase with repeated injections of the same dose (a phenomenon of anaphylaxis); (5) in consequence of (4) the therapeutic technique should vary for each animal and the doses of tuberculin should perhaps be diminished instead of increased in course of treatment; (6) B. E. has a very slow action on tubercles; it does hasten the retrogression of tubercles of the iris, but it does not prevent generalization of the disease, even in cases of complete local cure; (7) in control animals, tuberculosis of the iris might cure spontaneously, but in all cases there was generalization in the liver.

One question which has proved especially vexing is whether a determination of the opsonic index is necessary or even advantageous in the tuberculin treatment of eye-diseases. Stock (6) found that small doses at long intervals brought about a rise in the opsonic index in most cases, but these doses were without favorable effect on the patient's condition. For definite therapeutic effect, doses higher than were required

to work a rise in the opsonic index were invariably required. Stock came to rely wholly upon clinical observation as a guide to the effective dose, choosing the highest dose which the patient stands without reaction.

Another important point determined by Stock is that there is a marked change in the opsonic index after the artificial irritation (as by the instillation of dionin) of an eye which is the seat of a tuberculous lesion. The diagnostic value of this test is considerable.

DIAGNOSTIC AND THERAPEUTIC NOTES.

SURGERY OF THE LYMPHATIC SYSTEM.—Handley (*Lancet*, 1910, April 9 and 16). In 16 per cent. of all cases of mammary cancer, a lymphatic edema of the arm sets in. This causes extreme pain, the joints become stiff and the extremity useless. In cancer *en cuirasse*, the swelling of the skin of the thorax is, at least in part, also due to this type of edema. Formerly it was thought that these edemas were due to an occlusion of the axillary or other vein. Handley has, however, shown that they are due to the growth of carcinomatous masses in the lymph channels, occluding them and turning them into fibrous strands. Until recently the only effective therapy for this cancerous edema was amputation of the arm. Two years ago, however, Handley indicated a procedure by means of which the arm may be preserved and the lymph-vessels replaced by artificial ones. Silk threads are run along under the skin from the edematous to healthy areas and are allowed to remain *in situ* for some time. A fibrous tube forms about the thread and, upon the withdrawal of the latter, acts as an artificial lymph-channel. Handley has done this operation fifteen times with one death. The operation is only a palliative one and has no effect upon the cancer. It does, however, free the patient promptly from the edema and converts a useless and painful member into an efficient one.

In ascites, Handley formerly used Wynter's method of continuous drainage into the femoral canal by means of a peritoneal opening. A trochar with its cannula is thrust into the peritoneal cavity two inches above the symphysis. The sharp trocar is withdrawn and replaced by a long blunt probe. The femoral canal is then opened, the end of the probe within the peritoneal cavity directed towards the wound, and an opening of the peritoneum made at this point. The edges of the peritoneal opening are fixed by stitches and the wound closed. Of four operations of this sort, two resulted in permanent cure of the ascites; two were not followed by improvement, evidently because the peritoneal opening was obstructed by omentum or loops of intestine. Handley has, therefore, recently, in one case, used a modification of his method of lymphangioplasty. The abdomen was opened in the left semilunar line and the ascites evacuated. Four long, thick, silk threads were drawn, beneath the peritoneum, through the subperitoneal tissue of the iliac fossa. Having reached the neighborhood of the anterior superior spine, the ends of the threads were thrust, by means of a long probe, under Poupart's ligament into the subcutaneous tissue of the thigh. The patient has been permanently relieved of her ascites which evidently drains along the silk-threads into the tissues of the thigh and is there reabsorbed.

This work of Handley's is of the first importance and bids fair to replace both the Talma operation and repeated paracentesis.

A NEW SERUM REACTION FOR SYPHILIS.—W. de la Motte (*Deutsch. med. Wochenschr.*, 1910, No. 34). In spite of its great diagnostic value, the Wassermann reaction can never become a routine method for the practising physician, so long as its performance requires a well-equipped laboratory and a trained bacteriologist. Many attempts have been made to simplify it or to substitute simpler tests, but so far these have not been altogether successful. De la Motte, however, reports promising results with a substitute that was first suggested by Porges. The method in brief is as follows: Equal parts of clear blood-serum from the patient to be examined and of a one per cent. solution of sodium glycocholate (Merck) are mixed in a small test-tube, which is then set aside for sixteen to twenty hours. At the expiration of this time, if the reaction is positive, a precipitate has appeared, which usually forms a small clump, floating on the surface of the mixture. De la Motte made simultaneous tests of the Wassermann and the Porges reactions in a considerable number of syphilitics and non-syphilitics. On the whole, the two methods gave results that corresponded pretty well; certainly, in de la Motte's hands the Wassermann test did not seem superior to that of Porges. The method clearly deserves further trial.

LIQUID PARAFFINE IN CYSTOSCOPY.—Hoffmann (*Berl. klin. Wochenschr.*, 1910, No. 29). The turbid urine of cystitis not only interferes with the cystoscopic picture, but prevents ureteral catheterization on account of the danger of infection. If, however, the bladder is filled with an oily fluid, such as liquid paraffine, which does not mix with the urine, this may be avoided. The turbid urine collects at the bottom of the bladder, leaving the clear oil, with which the bladder is filled, undisturbed. Moreover, as Hoffmann shows, the pus microorganisms from the decomposing urine do not enter the paraffine, so that with a little practice the kidneys may be safely catheterized, even in the presence of a cystitis.

A NEW EARLY SIGN IN POTT'S DISEASE.—Athanasescu (Abst. in *Deutsch. med. Wochenschr.*, 1910, No. 33). It is a well-known fact that tuberculosis of the spinal column usually begins in the anterior portion of the bodies of the vertebrae. Any traction in the part of the spinal column must, therefore, be painful, even in the very beginning of the disease. To elicit this test, the patient is placed upon his back and made to bend his body so that it is supported only by the occiput and the soles of the feet; in other words, he takes up the position of opisthotonus. In the presence of Pott's disease, the patients either experience a sharp pain in the affected region on assuming this posture, or they are unable to assume this attitude at all, on account of the unbearable suffering it involves. Athanasescu was able, by this method, first described by Angelescu, to diagnose two cases of Pott's disease at so early a stage that neither pain on pressure, spinal rigidity, nor kyphosis could be made out.

HEMOPHILIA.—Sahli (*Deutsch. Arch. f. klin. Med.*, Vol. 99, Nos. 5, 6). Studies of a considerable number of cases of hemophilia, observed during the last seven years, have led Sahli to the following conclusions: The total number of white blood-corpuscles is usually diminished in hemophilia, but as a rule a moderate lymphocytosis is present. The most striking peculiarity of the blood is the high percentage of eosinophilous cells and mastcells; the blood-platelets, too, are increased in number. The coagulability of the blood is much diminished. It can, however, be markedly increased by the addition of normal blood-serum or of washed red blood-corpuscles. These observations speak for the theory that hemophilia is a disease of the cellular elements of the blood. In all probability the latter contains sufficient fibrin-ferment but too little thrombokinase. Therapeutically, Sahli advises the repeated withdrawal of small quantities of blood and the injection of fresh, normal, human blood-serum. The former stimulates the bone-marrow to the formation of fresh blood corpuscles, the latter causes the production of increased amounts of the deficient thrombokinase. Sahli's results with this method have been very encouraging.

LOBAR PNEUMONIA SIMULATING APPENDICITIS.—Bennecke (*Mediz. Klinik*, No. 7). Bennecke reports an interesting case. A boy, ten years old, with high fever and the signs of appendicitis, was operated upon but the appendix found normal. The fever continued and several days after the operation a typical pneumonia developed, affecting the left upper lobe, and running the usual course. He was able to find in the records of the Jena medical clinic, the histories of 21 cases of pneumonia, which at first presented the typical picture of appendicitis or of general peritonitis. Their subsequent course proved that there was no real peritoneal involvement. Pneumonias of the right upper lobe seem chiefly to dispose to this symptom-complex, which is most commonly found in children.

THE EARLY DIAGNOSIS AND PROPHYLAXIS OF PULMONARY HEMORRHAGE.—Mueller (*Wien. med. Wochenschr.*, 1910, No. 29). The writer has found that hemoptysis is almost invariably preceded for several weeks by a distinct rise in blood-pressure. Whenever such a rise occurs in tuberculosis, he believes a hemorrhage is to be feared. His prophylaxis consists of rest with the administration of digitalis and morphine.

CORRESPONDENCE.

PARIS LETTER.

THE RÔLE OF ANAPHYLAXIS IN ALIMENTARY INTOXICATIONS.

By AUGUSTE A. HOUSQUAINS, M. D.

In a preceding letter, I touched upon the new biological and medical idea which had received the name of anaphylaxis. As a result of the experiments made since 1902 by Drs. Charles Richet and Portier, the idea was advanced that certain toxic substances introduced into the animal organism, far from protecting it or immunizing it against another introduction of the same substance, rendered it on the contrary more sensitive and more vulnerable to future attacks. The nefarious action of the poison was of greater gravity after the organism had been exposed to the action of the poison a second time. This constitutes the condition which is known as anaphylaxis. In other words, an organism that is rendered more sensitive to the action of a poison is anaphylactic.

Although the experiments of Drs. Richet and Portier did not appear at first to have a direct interest for the physician, the possibility was nevertheless entertained that the state known as anaphylaxis might be of importance both from a medical and a therapeutic point of view. The events which have since occurred have confirmed this prevision, since all the studies which have been made have been in the direction of applying the new ideas to certain intoxications and infections. In fact, attempts have been made to demonstrate that when serums are injected into animals a second or third time, anaphylactic occurrences are not absent. Hence it can readily be seen of what importance the subject of anaphylaxis is to the physician. By grasping its import, the genesis of certain pathological phenomena and its place in the employ of the therapeutic means which are at our disposal are made clear to us.

Already, at the present time, there are so many points involved in the study of anaphylaxis that the subject is one of considerable complexity. Therefore, I intend to limit the material of this letter to the subject of alimentary intoxications in their relation to anaphylaxis. This interesting question is of the greatest interest from the standpoint of public hygiene. It is known that besides foods indiscriminately selected or more or less altered, certain fresh aliments can in exceptional circumstances cause intoxications. And it was just on account of the fact that this rather strange phenomenon had never been satisfactorily explained, that we owe the incipient idea which resolved itself into the subject of

anaphylaxis. Now although it cannot be said that anaphylaxis is so well understood that no further labors on its behalf are necessary, the very important researches of recent date would indicate that the desired goal will be reached before long.

A number of chemical facts are involved in the matter of alimentary anaphylaxis. Of first importance in this connection is cow's milk. We are fully aware of the untoward results when cow's milk is given to children under certain conditions, but what is of much greater interest is the fact that it is not unusual for grave disturbances to supervene after the ingestion of milk—disturbances that not only attract attention on account of their gravity, but on account of their suddenness, which even to-day cannot be explained. A case in point is when a suckling is weaned. Although it may have had no alimentary disturbances whilst being fed with breast-milk, directly it is put on cow's milk serious results occur. No improvement taking place, the child is again given the breast, and when conditions are more favorable cow's milk is substituted. Then almost immediately intolerance of undoubted gravity supervenes, which in turn disappears upon the resumption of cow's milk. Not only does cow's milk affect this intolerance but buttermilk also causes anaphylactic symptoms.

The administering of eggs has a similar effect on the organism. By eggs we do not mean those in which the white is so changed on account of staleness that it would affect all individuals in the same way, but eggs of prime quality which have a peculiar action on certain organisms, whereas on others the action is *nil*.

The following case reported by Dr. Lesné is typical: A child of eight who, since she had been weaned was in the habit of eating an egg each day without any untoward results, was suddenly seized during a repast with severe abdominal pains, diarrhea and extreme pallor of the face. These disturbances persisted for some days before they entirely disappeared, when it occurred to the attending physician to stop the eggs. Some months later the child ate an entremet which contained a small quantity of egg. Immediately the child was seized with decided abdominal pains and vomiting. The tongue was red and dry, the face drawn, the weakness extreme. The urine was scant, ascetic and albuminuric; the pulse very rapid and hypotension was present.

These clinical facts illustrate the characteristics of anaphylaxis: the long duration of the hypersensitiveness, the quick appearance of the disturbance, the severity of the toxic attack, the small quantity of the provocative agent, and the lowering of the tension during the paroxysm. It would be well to add here that the onslaught is not always so intense as I have just indicated, but it is not rare to see the ingestion of eggs followed almost immediately by vomiting, and by diarrhea with abdominal pains. These facts, so demonstrative of intolerance for eggs, are observed especially in the young. In adults they disappear without exception.

Milk and eggs are not the only aliments capable of bringing about anaphylaxis. All sorts of meats and the products derived from animals may have a similar action, but this is much rarer. Attention should be called to veal which some individuals cannot tolerate at all.

Shell-fish, crustaceans, and mollusks are the cause of frequent attacks of extreme gravity. Mussels should receive special mention, for they produce very often anaphylaxis and a symptomatology most characteristic. It would be well to add here that the researches of Richet were prosecuted

with a substance that is decidedly anaphylactic—namely, the extract of mussels, mytilo-congestine. Two or three hours after the ingestion of mussels the following symptoms occur: nausea, anxiety, oppression, general malaise; then vomiting, diarrhea, weak pulse, coldness; and at times delirium, convulsions and coma. Synchronously there appear certain itching symptoms such as urticaria. The remarkable thing about the occurrence is that the upset supervenes in subjects who have eaten mussels for years with impunity, and who on the day of the attack are in the best of health. All of which is in line with the usual symptoms characteristic of anaphylaxis. Oysters, sea-crawfish, and salt-water fish cause similar disturbances, although of less intensity.

Vegetables do not appear to be instrumental in calling forth anaphylactic symptoms; if attacks do occur they are extremely rare. On the other hand strawberries are not so blameless. The list of aliments could be greatly extended, for included in it are all those foods the peculiar action of which we explain by saying that certain individuals are intolerant of them on account of idiosyncracies.

By what arguments can one lend support to this pathogenic conception? According to Drs. Castaigne and Gouraud there are two very good reasons: one of a clinical nature, the other theoretic or experimental. The first has already been explained, but what can be offered on behalf of the second?

With the exception of strawberries, all the aliments which have been mentioned are composed for the greater part of vegetable or animal albumin. Hence it must be admitted that albumin is a decidedly provocative cause. That this has been verified beyond a doubt has been experimentally demonstrated in the case of milk, mytilo-congestine, and the white of eggs.

One objection, however, imposes itself—namely, that though experimentally anaphylaxis has been produced by cutaneous and venous injections, it cannot be affirmed that the condition has resulted from experiments in the intestinal canal. In the researches of Mlle. Bouteil a claim was made that the experiments by means of the intestinal route were successful, but this has been contradicted. Perhaps the penetration of a small amount of albumin, not digested by the juices of the stomach, into the intestinal parietes is the real cause of the disturbance. But this is only an inference.

The clinical and experimental facts certainly show that anaphylaxis is of alimentary origin, and that, as foreseen by Richet in 1903, a more extensive knowledge of anaphylaxis and of immunity after slight or grave attacks will do much to enlighten us as to what is really meant by that very lax and indeterminate expression—idiosyncrasy.

October 10th.

BOOK REVIEWS.

SELECTED PAPERS ON HYSTERIA AND THE PSYCHONEUROSES. By Prof. Sigmund Freud. Translated by A. A. Brill. New York: Journal of Nervous and Mental Disease Monograph Series. 1909.

This is the fourth of the series of monographs published by the *Journal of Nervous and Mental Disease*. The debt which English readers owe to the journal for giving them in this compact and easily comprehensible form the chief contributions of Freud on the psychoneuroses should be first acknowledged. Brill's translation must be very highly commended, not only for the very readable English into which he has turned Freud's rather complex German, but also for the skill he has shown in finding suitable words to express some of Freud's specific terms. These special terms of Freud have often been real stumbling-blocks even to those whose acquaintance with German idiom leaves nothing to be desired in the usual run of German scientific writing. In the translator's preface is contained a general view of the Freudian psychology, and a short sketch of its evolution during the fifteen years that have elapsed since Freud, together with Breuer, first published his justly famous studies on hysteria. The method used in psycho-analysis is described in enough detail to enable the beginner to understand, at least, in what way it is done. The difficulty of his technique is rather plainly stated when the author adds that unless one is fully familiar with the three contributions of Freud,—*Traumdeutung* (Dream Interpretation), *Psychopathologie des Alltagsleben* (Psychopathology of Everyday Life), and three contributions to the sexual theory,—the utilization of psycho-analysis in effective manner is wellnigh impossible. It is important that this point should be emphasized. Many have tried the Freudian method and charged it with failure, not realizing that they were at fault in not providing themselves with the proper knowledge of the technical methods necessary for its successful pursuit. Its technique is no more to be learned off-hand than the methods employed by a skilful chemist or bacteriologist. The papers contained in this collection are of extraordinary importance; and whether Freud's conclusions are true or not there is no question concerning the value of the insight he has given to the mental mechanism of the neuroses. It is necessary to remember this no matter what opinion may come to be final as to the truth of the etiology as put forward by Freud. In reading some of his papers the impression is readily created that a new and hitherto undreamed of territory has been opened up for psychical exploration, and that through psycho-analysis a method is given into our hands through which some of the devious paths of mental complexes may be followed. Another fact should be here pointed out and that is that most of these papers are of distinctly clinical value. The structure of Freud's hypothesis is entirely clinical and entirely objective in the sense that the study of actual cases furnished him with the data which he so untiringly used in the formulation of his doctrine, and which led him with such insistence to the conception that the etiology of the neuroses was largely sexual in character. This latter has formed the main objection to many of Freud's critics. Whatever the truth in regard to the etiology may finally come to be, it must be realized that apart from this, the unfolding of a psychoneurotic's mind in the Freudian sense has become possible to an astonishing degree and to an extent hitherto unthinkable and undreamed of. It is needless to add that some knowledge of Freud's work is absolutely essential to every neurologist, and nowhere except in the original journal can it be obtained so well as in this monograph. Chapter VIII. contains an address on psychotherapy which should be read for its wisdom and fairness. No one can know this paper without being deeply impressed with the sincerity and earnestness of Freud. In a mental state without prejudice and in the spirit which prompted this address, the reader is recommended to read further. It is only in this spirit that Freud's work should be studied.

SYSTEM OF SYPHILIS, in six volumes. Edited by D'Arcy Power and J. K. Murphy, with an introduction by Sir Jonathan Hutchinson. Vol. IV. Syphilis of the Nervous System. By F. W. Mott. New York: Oxford University Press. 1910. Price, \$10.50.

The fourth volume of this monumental treatise on syphilis is given over to the nervous system and its author is F. W. Mott. His name is enough to engage the serious attention of every reader, and the result of his efforts contained in this volume gives what the reviewer believes to be the best and most comprehensive work that is at present available. It is difficult when everything is so well done to point out specific excellences. Mott is above all a clinician; the basis of his knowledge is strictly anatomical, however, and as a result we find clinical descriptions of exactness with minute and careful histological studies of all conditions which are produced by the invasion of the syphilitic organism into the nervous system. This combination is rare enough to attract attention and the study of the different chapters gives the reader a point of view which cannot be too highly commended. The histological plates are excellent; they are fine and clear and the descriptive notes attached are selected with great care. A valuable historical summary of our knowledge of syphilis of the nervous system is contained in the opening chapter, and Mott clearly describes how it came about that tabes and paresis came to be thought of as syphilitic in origin. The examination of the cerebrospinal fluid, the Wassermann test and other methods of syphilitic diagnosis are described and their relative value carefully determined. Those who know Mott's previous work on syphilis of the nervous system, notably his Gulstonian lectures and his various papers collected in the archives of neurology from the Claybury Asylum, will welcome this definite volume with enthusiasm. Volume IV. of the system of syphilis is a brilliant contribution to a subject that is of vast and growing importance to medicine. To a neurologist this volume should be treasured above all others in his library, because it cannot but be an undoubted adjunct in the matter of increasing his clinical knowledge and his therapeutic efficiency.

A TEXTBOOK OF THE PRACTICE OF MEDICINE. By James M. Anders, M. D., Ph. D., LL.D., Professor of the Theory and Practice of Medicine and of Clinical Medicine, Medico-Chirurgical College, Philadelphia. Ninth revised edition. Octavo of 1326 pages, fully illustrated. Philadelphia and London: W. B. Saunders Company. 1909. Cloth, \$5.50; half morocco, \$7.00.

This edition is a thorough revision of its predecessor in accordance with the most recent advances in medical knowledge. Purely theoretical and controversial points have been omitted, without, however, slighting those latest bits of knowledge which seem to be already fairly established and on a practical basis. The same broad treatment of the subjects, which has characterized previous editions, and the special attention to prophylaxis are also noted here. Since acquiring our island possessions the subject of tropical medicine has been of increasing importance, and the author has kept pace in his text with the needs of the practitioner. Several subjects are treated for the first time, among these the "fourth disease" of Duke, chronic purpura, gastromyorrhea, essential hematuria, adiposis tuberosa simplex, and myatonia congenita. Besides these the latest advances in a number of subjects have been noted: Flexner's and Wassermann's serums in cerebro-spinal meningitis, Grocco's pleuritic sign, the hemolytic serum-test in cancer of the stomach and many points in the chapters on diseases of the nervous system. A little more than the mere mention of the Wassermann reaction in the diagnosis of syphilis would enhance the usefulness of the work; the entire lack of mention of this subject under diagnosis of tabes and parietic dementia seems regrettable in the light of the great practical value already attached to it. The success which has greeted the former edition of the work is equally deserved by the present.

SPONDYLOTHERAPY (Physio-therapy of the Spine). By Albert Abrams, A. M., M. D., F. R. M. S., Late Professor Pathology, Cooper Medical College. 420 pages, illustrated. San Francisco: Philopolis Press. Price, cloth, \$3.50.

This book aims to describe certain reflexes termed by the author, Spinal Reflexes. The author attempts to erect upon that slender foundation a system of mechanical therapeutics to which he has given the name, "Spondylotherapy."

He has given the name of heart and aorta reflexes and others to certain phenomena that take place in these organs upon stimulation of definite skin areas that are segmentally in relation to them. It is the author's belief that such reflexes are very definitely related to spinal cord centres. The stimulation of such centres are, therefore, of important therapeutic value. This is a brief statement of the author's views. There is included in this book no adequate proof that such reflexes exist nor if they do exist that they are of importance or constant.

The clinical cases are so badly described and carelessly recorded that they cannot be accepted in any sense as evidence of the therapeutic benefit of the method advocated. This book cannot be regarded as a serious addition to the literature of neurology, nor does it add anything of value to the treatment of diseases of the nervous system. The book must be regarded, chiefly, as an indication of the self-confidence of the author and of his touching faith in the therapeutic effect of spinal column tapping.

PRECIS DU TRAITEMENT DES FRACTURES par le Massage et la Mobilisation. Par le Dr. Lucas-Championnière. Un volume in-12 de 267 pages. Paris: G. Steinheil. Price, 3 fr. 50.

The little volume that Dr. Lucas-Championnière publishes is designed to give a resumé of all that which concerns the introduction of movement in the immediate treatment of fractures. All that concerns the beginning of this paradoxical method; all that pertains to the indications and to the smallest details of the application of the method has been studied and briefly shown, but with the necessary precision. The general application of the treatment, the indications of the limits of this application, the precaution to prevent abuses are studied in a very general way in order to fix the attention on the necessities of the practice. Then the fractures are studied in particular. For all fractures, for which the treatment is of the greatest importance, the chapters are enlarged and made to serve as a complete guide during the treatment; such are, for example, the chapters given up to the fractures of the radius, of the elbow, of the olecranon, of the superior extremity of the humerus, of the clavicle, of the fibula, of the two malleoli, of the neck of the femur.

A treatise as short as this cannot pretend to teach all that is concerned with the pathology and treatment of fractures in general. It is only possible in it to give the indications and point out the necessities for avoiding bad consequences by the employment of this new treatment. It is the author's desire to show quite clearly the necessity for mobilization in the treatment of fractures.

DIFFICULT LABOUR. A Guide to Its Management for Students and Practitioners. By G. Ernest Herman, M. B. Lond., F. R. C. P., F. R. C. S., Consulting Obstetric Physician to the London Hospital; Consulting Physician-Accoucheur to the Tower Hamlets Dispensary; late President of the Obstetrical Society of London and of the Hunterian Society, etc. With 180 Illustrations. New and Enlarged Edition, with Added Chapters on Retroversion of the Gravid Uterus and Puerperal Eclampsia. New York: William Wood and Company. 1910.

This volume hardly needs a formal introduction to the American physician. It undoubtedly is found in the library of every practitioner who ever felt the need of a book in which to look for ready advice in all complications of labor. This new, fifth edition, has been enlarged by the addition of two chapters devoted to retroversion of the pregnant uterus and eclampsia. It is surprising that the distinguished author of the volume still maintains his well-known conservative attitude in the treatment of eclampsia and other serious complications. He apparently abhors all methods of forced delivery, never feels that eclampsia calls for immediate delivery, never has used the Bossi dilator or performed a vaginal Cæsarian section because he has "no acquaintance with cases in which it is an advantage to the patient to be delivered in half an hour." We cannot but express surprise on finding him advising the use of ergot in placenta previa, etc. The author has revised his valuable book and mentions in this new edition all the more recently-devised methods, but he has remained markedly refractory towards these—if we may be permitted to call them so—advances of scientific obstetrics. Yet this volume is one of the clearest and most valuable treatises on the subject of difficult labor.

EXERCISE IN EDUCATION AND MEDICINE. By R. Tait McKenzie, A. B., M. D., Professor of Physical Education and Director of the Department, University of Pennsylvania. Pages 406; 346 illustrations. Philadelphia and London: W. B. Saunders Co. 1909.

This on the whole is the most thorough and satisfactory book that has yet been written on this subject. The manner of its writing is decidedly pleasing. It is written in a style that is easily understood by the layman, yet it is full of knowledge which is valuable to the physical culturist and the physician. The book takes up in Part I. the application of exercises to diseased condition; for example, flat-foot, round shoulder, etc.; then appears a description of the various systems such as "Jiu Jitsu." Part II. shows the value of massage and the place of exercise in the treatment of tuberculosis, also the Schott treatment for heart disease, etc. The treatment of constipation by massage and vibration and the treatment of hernia by exercises throw new light on these subjects.

EMERGENCY SURGERY FOR THE GENERAL PRACTITIONER. By John Sluss, A. M., M. D. Second edition, revised and enlarged with 605 illustrations, some in colors. Philadelphia: P. Blakiston's Son & Co.

A most useful book full of valuable points on the treatment of emergency. The wide range of emergency work is very well covered and the various phases of this most exacting branch of surgery are discussed, not at length, but with the idea of giving quick advice, making the book valuable at the time of emergency. At times this gives an air of dogmatism to the text which should not be misconstrued. The book is meant to be of value to the general practitioner who is called upon to take care of surgical emergency and it has admirably fulfilled this mission.

OBSTETRICAL NURSING FOR NURSES AND STUDENTS. By Henry Enos Tuley, A. B., M. D., Professor of Obstetrics, Medical Department University of Louisville; Visiting Obstetrician and Lecturer on Obstetrics to Training School for Nurses, John N. Norton Memorial Infirmary and the Louisville City Hospital. Second Edition, Revised and Rewritten. With 73 Illustrations. Louisville: John P. Morton & Co. 1910. Price, \$1.50.

This attractive little volume contains more information than its title would suggest. It presents a short and clear description of the phenomena of pregnancy, labor and the puerperium outside the specific information concerning the nursing of obstetric patients. The book will prove an excellent textbook for instructors in training schools.

GENESIS: A MANUAL FOR THE INSTRUCTION OF CHILDREN IN MATTERS SEXUAL. FOR THE USE OF PARENTS, TEACHERS, PHYSICIANS AND MINISTERS. By B. S. Talmey, M. D. With 19 Cuts and 47 Drawings in the Text. New York: The Practitioner's Publishing Co. Price, \$1.50.

The title defines with considerable accuracy the purpose of this little volume. Written by a physician who already has shown in his writings his familiarity with this subject, it evidences unmistakable signs of care and thoroughness. Moreover, the book may be commended for the reason that this difficult subject is presented at least better than it is in any other volume known to the reviewer.

SYPHILIS OSSEUSE. By Dr. Louis Spillmann. With 33 illustrations in the text and 134 pages. Paris: G. Steinheil. 1909.

This small volume presents a clear description of the syphilitic lesions found in the bones and is a most valuable work for anyone who desires to look up the literature or discover the latest ideas on syphilis of the bones. It starts with an historical review of the subject, and accompanying the text is a most valuable list of references. The illustrations, too, are of a high class.

BOOKS RECEIVED.

THE SURGERY OF CHILDHOOD INCLUDING ORTHOPAEDIC SURGERY. By De Forest Willard, A. M., M. D. (Univ. of Pa.), Ph. D., Professor of Orthopaedic Surgery, University of Pennsylvania; Surgeon (26 years) to the Presbyterian Hospital; Surgeon-in-Chief Widener Industrial School for Crippled Children; ex-President American Surgical Association, American Orthopaedic Association, Philadelphia Academy of Surgery, Philadelphia County Medical Society; ex-Chairman Surgical Section American Medical Association, Fellow Philadelphia College of Physicians, etc., etc. With 712 Illustrations, including 17 in colors. Philadelphia: J. B. Lippincott Company. Price, \$7.00.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles on Treatment, Medicine, Surgery, Neurology, Pediatrics, Obstetrics, Gynecology, Orthopedics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene, and Other Topics of Interest to Students and Practitioners. By Leading Members of the Medical Profession Throughout the World. Edited by Henry W. Cattell, A. M., M. D., Philadelphia, U. S. A. Volume III, Twentieth Series. 1910. Philadelphia and London: J. B. Lippincott Company.

DIFFICULT LABOUR. A Guide to Its Management for Students and Practitioners. By G. Ernest Herman, M. B. Lond. F. R. C. P., F. R. C. S., Consulting Obstetric Physician to the London Hospital; Consulting Physician-Accoucheur to the Tower Hamlets Dispensary; late President of the Obstetrical Society of London and of the Hunterian Society, etc. With 180 Illustrations, New and Enlarged Edition, with Added Chapters on Retroversion of the Gravid Uterus and Puerperal Eclampsia. New York: William Wood & Company. 1910.

ESSENTIALS OF LABORATORY DIAGNOSIS. Designed for Students and Practitioners. By Francis Ashley Faught, M. D. Director of the Laboratory of the Department of Clinical Medicine and Assistant to the Professor of Clinical Medicine, Medico-Chirurgical College, etc., etc., Philadelphia, Pa. Containing an Indian Scale in Colors, Eight Full-page Plates and Numerous Engravings in the Text. Second Revised Edition. Philadelphia: F. A. Davis Company. 1910. Price, \$2.00.

CLINICAL TREATISES ON THE PATHOLOGY AND THERAPY OF DISORDERS OF METABOLISM AND NUTRITION. By Prof. Dr. Carl Von Noorden, Professor of the First Medical Clinic, Vienna. Part VIII. Inanition and Fattening Cures. Authorized American Edition. Edited and Translated Under the Supervision of Alfred C. Croftan, M. D., Chicago, Ills. New York: E. B. Treat & Company, 1910. Price, \$1.50.

CLINICAL TREATISES ON THE PATHOLOGY AND THERAPY OF DISORDERS OF METABOLISM AND NUTRITION. By Prof. Dr. Carl Von Noorden, Professor of the First Medical Clinic, Vienna. Part IX., Technique of Reduction Cures and Gout. Authorized American Edition and Translated Under the Supervision of Alfred C. Croftan, M. D., Chicago, Ills. New York: E. B. Treat & Company. 1910. Price, \$1.50.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M. D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College, Philadelphia. Assisted by Leighton F. Appleman, M. D., Instructor in Therapeutics, Jefferson Medical College, Philadelphia. Volume XLI. No. 3, September 1, 1910. Philadelphia and New York: Lea & Febiger. \$6.00 per Annum.

Contents of Volume III. Diseases of the Thorax and its Viscera, Including the Heart, Lungs, and Blood-vessels, by William Ewart, M. D., F. R. C. P.; Dermatology and Syphilis, by William S. Gottheil, M. D.; Obstetrics, by Edward P. Davis, M. D.; Diseases of the Nervous System, by William G. Spiller, M. D.; Index.

DISEASES OF THE NOSE, THROAT AND EAR. By Charles Huntoon Knight, A. M., M. D., Professor of Laryngology, Cornell University Medical College; Surgeon, Manhattan Eye, Ear and Throat Hospital; Consulting Laryngologist, New York State Hospital for Crippled and Deformed Children, etc., and W. Sohler Bryant, A. M., M. D., Consulting Otologist, Manhattan State Hospital; Senior Assistant Surgeon, Aural Department, New York Eye and Ear Infirmary, etc. Second Edition, Revised with 239 Illustrations, Philadelphia: P. Blakiston's Son and Co. 1909.

CLINICAL TREATISES ON THE PATHOLOGY AND THERAPY OF DISORDERS OF METABOLISM AND NUTRITION. By Prof. Dr. Carl Von Noorden, Professor of the First Medical Clinic, Vienna. Part IX., Technique of Reduction Cures and Gout. Authorized American Edition Edited and Translated Under the Supervision of Alfred C. Croftan, M. D., Chicago, Ills. New York: E. B. Treat & Company. 1910. Price, \$1.50.

LIPPINCOTT'S NEW MEDICAL DICTIONARY. A Vocabulary of the Terms Used in Medicine and the Allied Sciences with their Pronunciation, Etymology, and Signification, Including Much Collateral Information of a Descriptive and Encyclopædic Character. By Henry W. Cattell, A. M. (Laf.), M. D. (U. of P.), Editor of *International Clinica*, Fellow of the College of Physicians of Philadelphia, etc. Freely Illustrated with Figures in the Text. Philadelphia: J. B. Lippincott Company. Price, \$5.00.

OPHTHALMIC SURGERY. A Treatise on Surgical Operations Pertaining to the Eye and its Appendages, with Chapters on Para-Operative Technic and Management of Instruments. By Charles H. Beard, M. D., Surgeon to the Illinois Charitable Eye and Ear Infirmary; Oculist to the Passavant Memorial Hospital, Chicago; ex-President of the Chicago Ophthalmological Society; Member of the American Ophthalmological Society, etc., with 9 Plates, Showing 100 Instruments and 300 Other Illustrations. Philadelphia: P. Blakiston's Son & Co. 1910. Price, \$5.00.

ATLAS OF EXTERNAL DISEASES OF THE EYE FOR PHYSICIANS AND STUDENTS. By Dr. Richard Greeff, Professor of Ophthalmology in the University of Berlin and Chief of the Royal Ophthalmic Clinic in the Charité Hospital. Only Authorized English Translation, by P. W. Shedd, M. D., New York. With 84 Illustrations in Color from Wax Models, Printed on 54 Plates with Explanatory Text. The Illustrations are from Models in the Pathoplastic Institute in Berlin. Art Director: F. Kolbow. New York: Reisman Company.

FACTS AND PROBLEMS OF RABIES. By A. M. Stimson. Hygienic Laboratory. Bulletin No. 65. Washington, Government Printing Press. 1910.

CHIRURGIE DE L'APPAREIL URINAIRE ET DE L'APPAREIL GENITAL DE L'HOMME. Par Pierre Duval. Troisième Edition avec 234 figures dans le texte. Paris: Masson et Cie. 1910.

CYSTOSCOPY AS ADJUGANT IN SURGERY WITH AN ATLAS OF CYSTOSCOPIC VIEWS AND CONCOMITANT TEXT FOR PHYSICIANS AND STUDENTS. By Staff-Surgeon Dr. O. Rumpel, Lecturer in Surgery at the University of Berlin. Only authorized English Translation by P. W. Shedd, M. D., New York. With 85 Illustrations in Color on 36 Plates and 22 Textual Figures. New York: Rebman Company. Half leather, \$8.50.

DIE SYPHILISBEHANDLUNG MIT DEM EHRLICH-HATA'SCHEN MITTEL (Dioxydiamidoarsenobenzol). Zusammenstellung der bisherigen Erfahrungen. Von Dr. Johannes Bresler, Oberarzt, an der Prov.-Heil- und Pflegeanstalt zu Lueben i. Schl. Zweite, bedeutend vermehrte Auflage. Mit den Bildnissen von Ehrlich und Schaudinn. Halle a. S.: Carl Marhold Verlagsbuchhandlung. 1910. Preis 1, 80 M.

GIRL AND WOMAN—A BOOK FOR MOTHERS AND DAUGHTERS. By Caroline Wormeley Latimer, M. D., M. A. Formerly Instructor in Biology, Woman's College of Baltimore. With an Introduction by Howard A. Kelly, M. D., Professor of Gynecological Surgery Johns Hopkins University. New York: D. Appleton and Company. 1910. Price, \$1.50.

NEPHRO-COLO-PTOSIS. By H. W. Longyear, M. D. Professor of Gynecology and Abdominal Surgery, Detroit Post-Graduate Medical School; Clinical Professor of Gynecology, Detroit College of Medicine, etc., etc. With 88 special illustrations and a colored frontispiece. St. Louis: C. V. Mosby Company. 1910.

BAKTERIOLOGISCH-CHEMISCHES PRAKTIKUM. DIE WICHTIGSTEN BAKTERIOLOGISCHEN, KLINISCH-CHEMISCHEN UND NAHRUNGSMITTEL-CHEMISCHEN UNTERSUCHUNGSMETHODEN. Von Dr. Johann Prescher und Victor Rabs. Zweite vollständig umgearbeitete Auflage. Wuerzburg: Curt Kabitzsch (A. Stuber's Verlag). 1910. Preis, broch. Mk. 5.50.

NEVER-TOLD TALES. By William J. Robinson, M. D., Editor of the *American Journal of Urology, etc.* Third Edition. New York: The Altrurians. 1910. Price, \$1.00.

AN INDEX OF SYMPTOMS—WITH DIAGNOSTIC METHODS. By Ralph Winnington Leftwich, M. D., Late Assistant-Physician to the East London Children's Hospital. Fourth Edition. New York: William Wood and Company. 1910. Price, \$2.25.

LIFE AND HEALTH. By James Frederick Rogers, M. D., Assistant Instructor Physical Diagnosis, Yale University; Author of "The Body at Its Best," and Other Essays. Philadelphia & London: J. B. Lippincott Company. 1910. Price, \$1.00.

PSYCHE. A Concise and Easily Comprehensible Treatise on the Elements of Psychiatry and Psychology for Students of Medicine and Law. By Dr. Max Talmey. New York: The Medico-Legal Publishing Company, 1910. Price, \$2.50.

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EDITORIAL.

METCHNIKOFF AND THE EVER-RECURRENT QUESTION.

In Metchnikoff's Harben lectures, which have recently been published in this country, there is a very wise essay on the subject which to-day is being more talked about in the lay journals than our invulnerable Puritanism ever thought it would be—namely, syphilis. This essay, which, by the way, is entitled "Hygienic Measures Against Syphilis," is brimful of sane remarks, and when we emphasize this, it is because few articles written by scientists and, for that matter, "practical" physicians, are not encumbered with the alluring theories of the writer put in such shape, that defiance is proclaimed against any reader who might have the temerity to question their indisputable value. But the head of the Pasteur Institute being an uncommon man, there is no indulgence in vain-glory; and nothing, in fact, proclaims this more than the words he writes, after pointing out how unsatisfactory were Levaditi's experiments with antisiphilitic sera and vaccines: experiments which any other writer of less truthfulness might have exaggerated into enough importance to have cast lasting glory on the work put forth by the Pasteur Institute. "His [Levaditi's] results" says the gentle philosopher, "mark the beginning of a large series of experiments that will have to be made. We have the less reason to enlarge on these experiments, as the prophylaxis of syphilis will probably not be discovered by the sero-therapeutic method. Sera may be of great use in preventing epidemic diseases, such as diphtheria or plague, or accidental diseases—as tetanus. In these cases no difficulty is experienced in the injection of serum to persons exposed to the risk of infection. With syphilis the case is different, as the injections would have to be repeated very often."

All this is interesting reading just at present, since the medical world is greatly wrought up over the Ehrlich-Hata discovery, and already the advocates of the sero-therapeutic treatment of syphilis are agitating against so silly and useless a procedure as the chemo-therapeutic treatment, as instanced in the latest arsenical preparation. Of course, as we all know, "606" is not a prophylactic measure; but even so, the mere fact that its influence over syphilis is decisive after one injection—and now we are basing our assertions on the honesty of such men as Wechselmann, Neisser, Alt, Schreiber, Iversen, Orth, Miekley, quite a goodly company to be in, we imagine,—goes to show beyond a doubt that the chemo-therapeutic treatment, while it may not have the supernal perfections claimed by the more enthusiastic, is effective enough to give us pause, and make us ponder as to whether we ought to wait for a serum which may never come, ere we wage war against a disease by means of a treatment that has been tried and not found wanting.

In contradistinction to the Russo-Frenchman's kindly admission that sera and vaccines have not proved as yet their title to serious consideration, we note among other Frenchmen—Metchnikoff on account of his long residence in Paris is surely no longer a Russian—a decided disposition to take the discoverer of "606" between their jaws and shake him into a senseless heap, in the hope that he will no longer molest the French scientific world. For example, there is Leon Daudet, the somewhat talented son of a great father, who does not hesitate to sputter in the columns of *L'Action française* to this effect: "A fearful calamity is about to be visited on us. This ——— of a German, Ehrlich, and his accomplices are continuing to make dupes of all Europe, especially France." "Ehrlich's discovery" declares *Le Radical* in a leader, "is fraught with the gravest dangers to man. Already the victims are too numerous to mention. Without a doubt the advertising which this remedy has received makes up in quantity what it lacks in quality." But these delightful excerpts are from political papers and must not be taken too seriously, since the underlying thought of the writers undoubtedly was a desire to prevent a despicable German from snatching any scientific laurels from the brow of French medical science. And with this thought in mind we were quite hopeful of less prejudice in the medical journals, until we saw in *Le Journal des Practiciens* of October 6th, an article that breathed almost the same spirit, for there we read that "the medical journals, which must be considered the most impartial, express the opinion that '606' is toxic, since it is not only a dangerous product, but a very dangerous one. Not only does it sterilize the treponema but, when the organism is weak, it sterilizes the patient."

In giving the foregoing extracts from French sources, it was not so much to ridicule the writers, on account of their invincible prejudices, as to indicate that the question of the cure of syphilis is still as ever-recurrent as it has been, since the first years when mercury was used. It is the question of questions in the medical world to-day, and though, as we said before, some of the best medical minds in Germany are at present willing to swear allegiance to Ehrlich, it will not be so easy to convert the obdurate to their way of thinking. Every physician, who has studied syphilis in its various phases, has his special way of treating it, as regards the size and frequency of the doses of mercury; and, what with "my idea" not being at all "your idea," oneness of opinion will have but a poor chance to be clothed in enough scientific respectability to command the respect of the medical world. And thus one can readily understand why, at least for some years to come, the question of the ultimate cure of syphilis will be on the *tapis*; and this despite the fact that Hallopeau is quite in a frenzy of delight because of his marvelous success in the use of hectine!

CITY NOISES: THE AMERICAN VOICE.

In the various published criticisms of our manner of life to-day, of the drawbacks which attend all modernism as illustrated in inventions which are supposed to make the course of daily existence engagingly smooth, we read a deal about the city noises, for which the motor-car, the street-car, and other devices are responsible; and both the medical sociologist and the reformer of no medical education are agreed that if these noises could be stopped the all-pervasive American disease, neurasthenia, would not be the formidable and almost incurable disturbance that it is at the present time. While we do not wish to convey the idea that the noises which have invited unkind criticism from the aforementioned reformers are not disturbing factors in the general upset which follows distraught nerves, we should like to remind all those who have written on this vastly interesting subject that their denunciations, due to the imitative quality which makes all of them nearly alike, are not quite complete, since they make no mention of a city noise that, similar to what has so often been said about the defenceless poor, is always with us. We are now speaking of the American voice, which has a chromatic scale no other voice possesses, and so many irritating qualities that, were a nerve removed from the healthiest body and subjected to the prickings of its many

stridencies, we are quite sure it would wriggle at once with an activity that could not be interpreted as aught but a mild protest.

It has been remarked by thinkers, who have given much thought to human adaptability, that our organism is so well proportioned that adjustment to circumstances is its prime quality. Granting the full worth of this truism, we are nevertheless not oblivious to the fact—and by “we,” medical men are to be understood—that adaptability may have its limitations, especially if the powers of resistance are lowered. Now, can it be said that an occasional noise such as emanates from a motor-car, a street-car, or from a factory whistle can play the same havoc with our powers of resistance that is effected by the uninterrupted iteration of a noise that follows us even into the sanctity of our homes? Surely, the American voice as it falls upon our ears must make for so tight a clutch on our nerves that the combined effect of all other noises dwindles into comparative insignificance.

In the hurry which characterizes our mode of life quite a number of things, which might have strengthened our amenities, have been overlooked; but, viewing all of them with a critical eye, none in our humble estimation ranks with our neglect of the cacophonous voice so unmistakably racy of our soil. Just why in our few moments of relaxation it has never occurred to us that our nervousness might be traced to its undoubtedly disturbing elements is a problem whose solution would require deeper cogitation than the present writer is capable of. But the glaring fact remains that we have made light of a matter fraught with importance, and in marshalling our full strength against the defects in our civicism, have missed out just where our severest condemnation was necessary.

We have been told by those who seem to have the clairvoyance not only to see what is lacking in our daily existence, but what cure should be applied to our social ills, that recreation is but poorly understood by us. Now while the writer of these lines knows only too well that recreation may mean one of many diversions.—may mean, in fact, such diametrically opposite pastimes as athletic sport, travel, reading, or theatre-going, let us for convenience sake imagine an amiable American who prefers the complete relaxation, which should come to him in the lecture-room or the theatre, to efforts incident to the athletic field or to globe-trotting.

Let us allow him to go to his favorite haunts in search of the cure his tortured nerves demand,—those nerves that unwittingly subjected themselves throughout the day to all the city noises, including the obiquitous and omnipresent vocal harshnesses in street and business-house,—and what alleviation of his perturbed condition is effected? Again he hears tones

that sooth not, sounds that seem to issue from the top of the head after circuitous journeys through the narrowest of passages, and a vocalism that is so high-pitched that all its nasalities act upon his sensitiveness as would pin-pricks. Still ignorant of the reason why his spirits continue to be ruffled, he wanders homeward, and the peace that comes to his tired brain during sleep is again rudely jarred the following day.

A picturesque over-statement these words of ours may be, but even granting this, is not a slight exaggeration of a condition better than an apathetic attitude, that takes but small notice of what might be an offending cause in the matter of our much-discussed nervousness? The scientific mind is only too often so thoroughly engaged with what this special sort of mind should look for, that the supposedly infinitesimal in the causation of disease is completely disregarded. This has been repeatedly illustrated in the history of medicine, and much to our later discomfort; a case in point being the scientific, stubborn front that we all assumed some few years ago when mental healing was first propounded. And yet to-day we have admitted it at least into the ante-room of that precious house of science, whose drawn curtains are sometimes too tightly drawn to admit the light of day. Hence the question arises, How can mental healing be beneficent, in any of the complicated disturbances of nerves of which we read so much nowadays, if the mind is not in a state of placidity? And, furthermore, can it be admitted in all fairness, that so obtrusive an element in our daily existence, as is the American voice, has the insignificance that one would think it had, as a contributor to our mental upset, from the fact that our smiling toleration of it has left it outside the pale of adverse criticism?

OPINION AND CRITICISM.

NUTRITIONAL DISTURBANCES IN CHILDREN.

Infant feeding has been on a basis of pseudo-science for so long a time,—in theory changing from one system to another, in practice from one food to another until something was found which the sick child could assimilate,—that we approach a new system with rather mingled feelings. Anything promising a rational basis to replace the present hit or miss therapy is more than welcome, for the reason that we are sceptical when we remember the theoretical beauty of all the systems and their limitations when put into practice; when we recall how far from completely satisfactory is the bedside application of feedings based on calories; how often the percentage method has failed; and finally how we returned to the methods of our foremothers to find out what suited our patient best.

However, it seems to us that the inherent error in previous methods—namely, that of overlooking the necessity of individualizing the patient—has to a great extent been overcome by Finkelstein's new work. He has been fortunate in having as material for study children in whom he was able to follow the onset, the course, and the termination of each case. Based on the natural assumption that a normal baby will thrive on mother's milk, he finds that he can divide nutritional disturbances of infants into groups, whose symptoms are caused by dietary errors involving the food balance, *i. e.*, either too much of one kind is given or its relations to the others are not correct.

The first large group is his *Bilanz-Störung*, in which the symptoms are irregular temperature tending toward subnormal, stationary or decreased weight, and soapy stools containing in excess magnesium and calcium salts. This is due to the use of excessive fats, and may be cured by proper dietary restrictions. In contrast to this, his second group of *Dyspepsia* is due to excessive carbohydrate in the diet. The temperature is high, there is vomiting, rapid loss of weight, the stools are thin and watery with a few curds present. The condition clears up rapidly on removal of carbohydrate from the diet, but when not recognized may quickly pass into the stage of *Intoxication*. In this condition all the symptoms of the second stage are present in a more intense form, with marked nervous symptoms and collapse. Treatment here is again mainly dietary, but is beset with much more difficulty than in the second stage.

The fourth group, *Decomposition*, is characterized by subnormal temperature, very rapid loss in weight, collapse without mental manifestations, and stools soapy or thin, according to the causative error in the diet. The syndrome may be caused by any single food element, especially by fats, and is the most serious form of nutritional disturbance in infants.

From this necessarily incomplete review, it can be seen that the logical basis for the classification is more rational than the old way of treating all such cases as gastro-enteritis or cholera infantum. It takes into account not only the general need of the organism in calories, but also the specific want or excess of any particular food. The division into groups renders the treatment eminently practical and simple; and, if the practitioner is as able as Finkelstein seems to be in grouping his cases, he ought to be able successfully to treat them. It certainly seems very doubtful if all nutritional disturbances can be classified on this metabolic basis any more than they could be on a bacteriological one, but the attempt to do so is a big step forward in a new direction.

TISSUE CULTIVATION.

Some wise man once remarked that advances in medicine depended more on improvement in technique than on an increase of abstract knowledge. The use of bacteriological knowledge and technical skill has advanced surgery to its present position of unlimited power and fearless aggressiveness. We have already called attention to one field of surgical research in which workers, by pure conquest of mechanical difficulties, have demonstrated as possibilities what formerly were considered chimerical dreams. Carrel, whose work on the surgery of the heart and large blood-vessels was made the subject of previous remarks, is again in the foreground of attention because of his work with Burrows on tissue cultivation outside the body. Following the original investigations of Harrison on the regeneration of nerve-tissue, and using a similar technique, modified by Burrows, the details of which are not given, Carrel and Burrows for the first time succeeded in growing normal adult tissue outside the body. They then studied a chicken sarcoma and not only produced growth in the first generation, but they successfully "raised" a second generation of sarcoma-cells. At the time of this writing a report of work done on a human sarcoma is just out, and it is difficult to say how rapid will be the bounds on this new path. It all gives one the uncanny feeling that the eternal mystery of protoplasm may be solved, and the answer given to the question, "Whence the first amoeba?"

This study recalls to mind the researches of Barber on the isolation and cultivation of a single bacterium. With simple apparatus and small

capillary pipettes, Barber, a few years ago, developed a line of investigative technique by which any man with patience can fish from a mixture of bacteria the single bacterium he wants, place it in the proper culture media and study the family it produces. Weird as this may appear on paper it is startlingly simple and requires no unusual technical skill. We cannot help bringing these two remarkable studies into close relation, and wondering what results would accrue, were some student to take, for instance, a giant-cell and a small round-cell from a mixed-cell sarcoma, place them in proper surroundings for growth, and investigate their descendants. Possibly some astoundingly new ideas regarding mutations might be forthcoming, and a severe jolt given to those who are content with the theory of evolution as an explanation of all the phenomena of existence.

POST-GRADUATE STUDY.

The meeting of surgeons held in Chicago last month, which was the outcome of invitations sent by the Editors of *Surgery, Gynecology and Obstetrics* to all physicians and surgeons of the United States, Canada and Mexico, who were interested in clinical surgery, seemed in every way a great success. It was the first gathering of its kind ever held in the Middle West, and whatever the doubts may have been as to the number of acceptances they were dissipated by the difficulty experienced by even the large number of clinics in Chicago in handling the crowd. The spirit of the meeting was distinctly that of post-graduate study, and it was shared in, not only by those who enthusiastically demonstrated, but also by the men who came to learn. In this respect it differed considerably from the usual medical convention, at which the majority attend to meet their *confrères* first and, as a second consideration, drop in to hear lectures.

Essentially surgical in its nature, the main object of the meeting was to show, day after day, in hospital and clinic, surgical cases; to discuss difficult diagnoses; to demonstrate operations of all sorts at close range. And yet the other sides of modern surgery were not forgotten; much late work on the experimental side was shown, and considerable importance was paid to border-land knowledge in medicine, in pathology, and in the allied specialties. In short, it offered a condensed course of study for the busy practitioner, giving him in a brief time numerous opportunities for refreshing his memory as to old methods, and for learning new ones. The hearty response to the call showed the need thereof, and demonstrated the fact, that the physician, no matter how busy, desires opportunities for post-graduate study and will grasp them when offered.

Post-graduate courses of study form a field of medical education that should receive considerable attention. No elaborate system of dovetailing is needed, the facilities of almost any good hospital furnishing a basis for excellent teaching. Surely, most of the big medical centres could well afford to bear in mind the success of the new idea tried in Chicago.

LITERARY NOTES.

Those neurologists, who are still interested in the rather extraordinary career of Jack the Ripper, will find an interesting chapter on his sensational irruption into the Whitechapel district in Dr. L. Forbes Winslow's recently published "Recollections of Forty Years." But the Jack-the-Ripper incident is only a small part of a book that is written in terse English and epitomizes the varied experiences of one who has figured as an expert in some of the most celebrated criminal cases of recent years. Interesting reading, indeed, this is, and though the reader may hold opinions of Mrs. Maybrick, Mary Ansell, and Mrs. Fleming other than those entertained by Dr. Winslow, he cannot but admire his skill in unraveling the complicated skeins, in whose meshes are hidden so much that escapes a mind not steeped in medico-legal quiddities. Aside from the medico-legal matters the book contains much that will hold the reader's attention, for Dr. Winslow is a keen critic and has the necessary perspicacity to differentiate between sterling mental qualities and foibles. His American experiences, for instance, cannot be considered in any other light than the outcome of our insatiate desire to make all celebrities, who visit this country, as uncomfortable as the vaunted freedom of our press chooses to elect. The garbled newspaper accounts of his rather innocent remark as to whether women ought or ought not to ride bicycles make ludicrous reading; but though our own sense of humor is aroused, we must not forget how very serious are such matters to one, who in all innocence makes a confidant of a reporter in the hope of having his words printed exactly as they were uttered. Among the anecdotes with which this book is enriched, one stands out with peculiar significance, since it recalls to the reader's mind a figure in the science of criminology that was once commanding, but is now somewhat tattered by considerable adverse criticism. We are now speaking of Lombroso. Dr. Winslow's anecdote runs as follows: "He [Lombroso] had a wonderful personality. He was a kind-heated man, though he was dreaded by students when undergoing examinations for their degrees at the University of Turin, in consequence of his manner not being properly understood, which frightened the timid examinee; but behind his brusque demeanour was a capacious, kind heart, and a mind open to conviction. He would say to the student with a small and badly formed head: 'You have mistaken your calling; you are a degenerate.' To another he would say: 'From the formation of your head, you are an epileptic.' Whilst to a third he would remark: 'From your general aspect, demeanour, and sly appearance, you are a moral pervert.' Unless the students agreed with all Lombroso said, they were sure to be plucked. One doctor of medicine at Turin, who had gone through the ordeal, told me about this."

Guy Patin has found a new biographer in one Pierre Pic, a French writer who already has some claim to fame on account of his amusing work, "The Aperient Pills from the Extract of Montaigne" (*Les pilules apéritives à l'extract de Montaigne*). As a commentator this new biographer of the quarrelsome Guy is inexorable, and as a ransacker of hidden treasures which can illuminate, so that a better understanding of a character may be effected, he is quite the adept. Hence the picture we get of the obstreperous Dean of the Faculty of Paris is one of completeness, with no shadowy outlines to throw doubt on the full meaning of a temper that got beyond the exhilarating stage when the School of Montpellier, Théophraste Renaudot, or anything else of a medical nature, that seemed opposed to the Faculty of Paris, insinuated itself within the limited field of his vision. The letters to Charles Spon are again produced: those letters that must have made the year 1707 memorable in French medical circles, for by their publication the man, Guy Patin, became patent to all eyes, and, moreover, was stripped of any kindly mental trait his coterie of friends may have attributed to him. In one of his letters to Spon, Guy Patin thus speaks of the surgeons of his day: "There are still honest people in France who know how immeasurably superior to these despicable ignoramuses are the physicians; and I pride myself on the fact that I have in no small way contributed to their downfall. The surgeons of Saint-Côme persist in their crimes, for they have made the principal barber their chief. They are insane, out of their heads, and know not to what saint to turn, in their mad desire to retain their robes and pointed hats." In another, he cheerfully comments on the overflow of physicians in the provinces in this wise: "The principle cause of this misfortune is the ease and readiness with which Universities turn out physicians. At Angers, Caen, Valence, Aix, Toulouse, Avignon, diplomas are easily bought. This is an abuse which should invite punishment." What strikes one upon reading the letters addressed to Charles Spon, who was physician and archeologist at Lyons, is that the irascible Guy, with his purblind admiration for everything in and around the Faculty of Paris, should have deigned to make a confidant of one who was completely outside the charmed circle. But perhaps even within the hallowed walls of his pet medical school, all was not as it should be in a well-conducted house, and dissensions may have been rife, though the invincible pride of the Dean would not allow of their betrayal to the outside world. Or, again, he may have been as sceptical of his friends in the Faculty as he was of therapeutics, for he formulated a very simple dictum for all diseases—namely, bleeding and purgation: a dictum that aroused much laughter from Renaudot and the much-despised provincial physicians and surgical worshippers of barbers.

ORIGINAL ARTICLES.

THE DUTY OF THE COMMUNITY TOWARD ITS CONSUMPTIVES.

By GUTHRIE McCONNELL, M. D., of Philadelphia.

Until comparatively recent years the general public of this country was not inclined to admit that city governments, or any other form, had the right to interfere with the freedom of the individual when the matter was one concerning health alone. Various regulations were enforced to some extent in the older centres of habitation but they were carried out in the face of more or less opposition.

As the causes of diseases became better understood, and this has been within the past thirty years, the citizens began to appreciate better the efforts that were being put forward by the physicians to control disease. It was recognized that it was no longer possible to consider a patient as an individual who in no way affected others than himself. With the increased knowledge of bacteriology the method of transmission of disease was better understood.

The communities at first undertook to regulate and control health matters as a means of personal protection rather than as a form of economy. In addition to the actual loss of life there is the tremendous financial waste caused by disease. Of all the infectious diseases the one that is of the most importance, both from the view of the number killed by it and from the tremendous loss of money entailed, is tuberculosis. The further, and more thorough, the investigation the more appalling become the figures.

We have been accustomed for so many years to accept consumption as being always with us, like the poor, and the two go hand-in-hand, that we have been largely indifferent. If, however, we investigate a little we will find things that should stir us from our apathy. If the figures over a large part of the country are taken, it is found that each year there occur from tuberculosis in all its forms a death-rate estimated to be 164 per 100,000 of the living population. If the population of the United States is taken as 83.9 millions for the year of 1906, the number of deaths from tuberculosis will be 138,000. That tremendous number dying from a disease that is preventable!

Looking at it from another point it will be found that the deaths from tuberculosis equal the combined deaths from typhoid fever, scarlet fever,

smallpox, diphtheria, cancer, appendicitis and meningitis. There is some excuse for the death-rate being somewhat greater, but not to the extreme degree that exists. The majority of the other infectious diseases run a much more acute course and do not remain as sources of danger to the public for so long a period.

Comparing the number of deaths from tuberculosis to the total number of deaths for all ages we find that one death in every nine is due to the tubercle bacillus. When, however, a more limited period is taken it will be seen that for the entire population the deaths from tuberculosis of the lungs at the third decade of life are almost exactly one in three.

There is also not only loss of life but there is the preceding disability. It is self-evident that one who is sick will be unable to accomplish as much work as he could if he were well. It has been found through inquiries made in numerous instances that death from tuberculosis in workmen was preceded by an average period of eighteen months of total disability. A time when the sick individual was not only unable to make money but was a constant drain upon the family resources. This above condition followed a previous period of nineteen months of partial disability during which time the workman was able to earn about half wages.

When there is taken into consideration the number who have had tuberculosis one is overcome by the widespread extent of the disease. The only cases from which statistics concerning the prevalence in the living can be drawn are those who have been sufficiently indisposed to obtain the services of a physician. There is, however, a great class in whom the disease obtained lodgement and brought about some temporary disturbances of health but who recovered. The number of such individuals has been estimated by making careful examinations at autopsies for indications of healed tuberculosis. The figures differ considerably according to the standard set by each investigator as to what constitutes an old tuberculous lesion. The minimum percentage of people who at some time during their lives have had tuberculosis would not be less than 58. It is, however, possible that from 70 to 95 per cent. may prove to be the more correct estimate.

Loss of life and disability to work, both resulting from tuberculosis, are serious matters to the individual and his immediate family. Especially when that person happens to be the wage-earner. The economic waste as a result of the above conditions is moreover of the greatest importance to the city and the State as well. The annual value of a man's labor has been placed at different sums and as a result the ultimate estimates of the annual loss vary considerably.

The Maryland Commission on Tuberculosis finds that "the average individual loss entailed by the disease for each wage-earning male dying in Maryland from tuberculosis is \$741.64. The total potential loss to the State entailed by the deaths from tuberculosis each year, cannot at the very lowest estimate, be less than ten million dollars."

Dr. Thomas, of Chicago, estimates that the cost of tuberculosis in the State of Illinois amounts to thirty-seven million dollars annually. The Ohio State Commission estimates the loss in Ohio at seven million dollars annually.

Dr. Biggs, in regard to New York City, says: "It may be conservatively estimated that each human life at the average age at which the tuberculous deaths occur is worth to the municipality \$1500. The cost of each life at this age is usually more than this. This gives a total value to the lives lost annually of fifteen million dollars. We may further assume that for an average period of at least nine months these persons are unable to work and must be cared for. The loss of their services during this period may be estimated at one dollar a day, and the cost of food, nursing, medicine, attendance, etc., at a dollar and a half more per day, making a further loss of two dollars and a half a day for each person dying, for a period of two hundred and seventy days. This gives us a further loss to the municipality of eight million dollars, making a total annual loss to the city from tuberculous diseases of at least twenty-three million. It has been estimated that in the United States not less than a hundred and fifty thousand deaths are caused annually by tuberculous diseases. By estimating the value of these on the basis just given, we have an annual loss to the country of more than three hundred and fifty millions."

Other estimates put the annual loss from tuberculosis in the entire United States as low as one hundred and forty millions.

An interesting itemized account of his estimated losses is the following that was given by a New York merchant who eventually went to Colorado permanently:

Loss of business for six months preceding illness.....		\$5000
One year cost at Saranac.....	\$4500	
Less regular expenses.....	1500	3000
Loss occasioned by absence from business in New York.....		8000
Cost of seeking new location in the West.....		3000
Loss of income during change.....		2000
Total.....		\$21,000

So far we have discussed the economic phases of the question but nothing has been said concerning the ways of controlling the disease. It is very plain that anything that entails a loss of hundreds of millions of dollars annually is something to be attacked with vigor. The important question, therefore, is what can be done by the people as a government to eradicate this disease. That advances can be made in controlling it is due to the discovery by Koch of the tubercle bacillus. It was his work that opened the way for the modern handling of tuberculosis. For many years the disease had been well known clinically but until the causative agent was discovered comparatively little advance was made in the methods of combating the plague. Knowing how it was trans-

mitted it was then possible to take such measures as would hold the infection in check.

Even after the discovery of the tubercle bacillus some time passed before the idea of the hereditary infection was discarded. We now know that it is very rare for an individual to be born with the organism of tuberculosis within his tissues. People become tuberculous by acquiring the disease from others already stricken. With that as the corner stone an elaborate method of prevention has been constructed. Although there has been comparatively little advance made during the past fifteen years in knowledge relating to the disease, there is now greater activity than ever in applying what we know.

In the control of tuberculosis there is one regulation that must be accepted at the start as being the keystone in the plan of the campaign. That one is the necessity of notification. By that is meant the essential importance of having the health authorities notified of every case of tuberculosis that comes to the attention of all those more or less directly following medicine as a profession.

Various objections have been advanced by men opposed to such a law but they do not as a rule deserve much consideration. Amongst the first is that a medical secret is being divulged. But since the reporting of smallpox, scarlet fever and other contagious diseases is required by law and complied with by physicians it is not a strong point. The strongest argument is that the families in which there is a case of tuberculosis will refuse to carry out instructions thus necessitating constant supervision by the health authorities. This objection holds good to a certain extent, mainly amongst the poorer and more ignorant class, but becomes less marked as the importance of sanitary measures becomes more widely recognized. It is also by means of compulsory notification that the poorer classes will become informed of the law and of the attempts that are being made to better the condition of the people in general.

Of course the compulsory notification and registration is not the final act; it is merely the beginning of the campaign. By means of such a law the health authorities have been informed as to the whereabouts of a new focus of the disease. Every tuberculous individual is a danger to the community in direct proportion to his ignorance and carelessness. His sputum is the infecting agent and when this is made harmless the patient himself becomes harmless. According to the stage of the disease, the sputum may contain few or many tubercle bacilli. If it is expectorated carelessly the material will dry, become finely ground and well adapted for widespread dissemination. Slight currents of air disturb the dust and other members of the household inhale it with consequent infection. By this means the children of a household can acquire the disease. It is not the result of an inherited infection but is due to their living in an atmosphere containing the tubercle bacilli.

To get into direct contact with the patient it is necessary that someone

in the employ of the health department should immediately visit him upon notification of the case by the physician or nurse. The visitor should determine what efforts must be made to check the disease. And it is very largely at this point that the authorities can gain or lose the good-will of the community. If the inspector finds that the case is among intelligent people who are taking the proper precautions, as suggested by the physician, there is no need for the state to interfere. If, on the other hand, it is found that the people cannot or will not carry out what is necessary, it is then time to take hold and to make use of force if nothing else will do. The visiting physician or nurse should give verbal directions; and, if the people can read, distribute circulars telling what should be done.

Data concerning the case should be as complete as possible as by such means much valuable information can be acquired. The patient's history, not only concerning his immediate illness but in regard to the form of work he does and to his social existence, should be obtained. Notes should be made of the sanitary conditions in which he lives, the size of the rooms, the number of people who occupy the same space, the amount of light and of ventilation, the relative cleanliness of the surroundings and numerous other things. From the observation of the general surroundings can be determined whether or not it be necessary or advisable that the patient be removed to a hospital. This is a matter that depends upon the experience of the visitor as no set rule can be carried out. What may be the right thing to do depends upon the general conditions and must be settled in each individual case. There are times, however, when the immediate removal to a hospital is essential.

In addition to the regulations concerning notification and registration there should be provided by the cities proper facilities for the aiding of physicians in the making of the diagnosis of tuberculosis. There should be a laboratory in which free examinations of sputum for the tubercle bacillus should be made in all instances of suspected tuberculous disease. Such an examination should, nevertheless, never be substituted for a physical one. A good physician should be able to make a diagnosis of tuberculosis by means of a physical examination before the tubercle bacilli appear in the sputum. He should remember that absence of tubercle bacilli from the expectoration does not indicate that tuberculosis is not present. The earlier that the diagnosis be made the better the chance of curing the patient and rendering him no longer a centre for the spread of the disease. Such bacteriological examinations, however, are to be made only if the required data concerning the case be furnished.

Providing a laboratory is, however, not all that needs be done. To have any facility made use of depends upon the ease with which it can be employed. The city should make some arrangement so that the necessary bottles for the collecting of the sputum, the cards for the data, etc., can be readily procured. At the same time there must be some method by which these specimens can be quickly got to the laboratory.

It is not always easy for a physician to go from one area of a large city to a distant situation in order to have the sputum examined. He should not be expected to do so and provision should be made to relieve him of that duty. This can be done in various ways. In many cities the district police stations act as centres where the specimens may be deposited and then forwarded to the laboratory. The duty of the laboratory, in addition to the reporting the result of the examination, is to keep proper and complete records of the specimens that have been sent for determination.

So far the methods mentioned in regard to controlling the disease have been of a technical character; they have concerned the physician and his relation to his patient. Much, nevertheless, can be accomplished by reaching out after the laity as well as after the profession. The greater the amount of information and the more widespread it is the better can the disease be controlled. The fight against tuberculosis is largely one against ignorance. Only by the diffusion of knowledge concerning this disease can we hope to restrict it. The question then arises as to what methods can be employed in the furtherance of the educational measures. It is not enough to deal with a small class of the more intelligent. It is upon the improving of the large class of the less intelligent that the work rests.

Large numbers of circulars should be printed and distributed and these should not be written in English only. They should be translated into the various languages that are spoken in the congested areas of the large cities. In New York City there are more than eight languages employed.

In addition to the use of printed matter much may be accomplished by the giving of public addresses. Illustrated lectures given to schools, societies, associations of all sorts, particularly of employees, are extremely valuable. One cannot start the work at too early an age. To teach the children the value of sanitation is to set loose a leaven that will constantly exert itself.

In recent years one of the most instructive measures employed has been the setting up of tuberculosis exhibits in localities where many people can see them. These exhibits consist of wall-placards giving statistics concerning the disease, regulations dealing with the care of the patients, sleeping arrangements for home use as well as in sanatoria. In fact, anything that deals with the tuberculous should be used, from sanitary spittoons to notification blanks. These exhibits are moved from one locality to another so that as many people as possible may visit them and acquire an increased amount of information.

After a patient has been removed to a hospital or has died it becomes necessary to render the place where he lived no longer a focus of tuberculosis. The apartments and clothing should be disinfected. The various ways of doing this will not be mentioned, as such information does not bear directly on the present discussion. The disinfection should be done by the city at its expense. It is not right that the sick individual should

have the additional expense at a time when the finances have been badly drained.

The more clearly that the method of dissemination of the disease is understood the more economically can the protective measures be carried out. Thousands of dollars have been lost to cities and individuals as a result of ignorance concerning the spread of yellow fever. Costly fumigation plants have been erected and personal property of great value burned because it was not known that the mosquito was the transmitter of the disease.

No one should move into a room or a house where a tuberculous person has lived unless there has been a previous disinfection. To do so is to take foolish risks with the great possibility of acquiring the disease.

Although the patient has been visited immediately upon notification yet that one visit is by no means the last. The patient should be seen frequently in order to follow closely the case, to see whether or not the instructions given are being properly followed and to watch the progress.

Under certain conditions it may be necessary for the city to supply suitable food, such as milk and eggs. The expense may seem very great but anything that will prevent disease or shorten its course is economical. The time will probably come when the public will realize that prevention is the only proper method of treatment. Hospitals and food may appear as luxuries but for the welfare of the community they are nothing more than necessities.

Although the word hospital is generally applied the more accurate term would be municipal institutions for the care of the tuberculous. These differ according to the needs of the individual patient, whether or not the case is far advanced.

In taking up this phase the first point to be discussed will be the necessity of having hospital accommodations for the advanced cases. The following details are taken largely from the paper of Dr. E. A. Locke and Dr. S. F. Cox on the hospital conditions in relation to the consumptives of Boston.

They state that hospitals should be provided for certain classes of the tuberculous. First, the destitute cases; second, all those, who because of ignorance, carelessness or indifference, are a menace to the community; and third, the majority of dying cases.

According to the hospital facilities all advanced cases of tuberculosis may be roughly divided into four general groups.

1. Those in the last stages, or the hopeless and in many instances the dying. It is in such as these that the sputum is the most profuse, that the tubercle bacilli are the most numerous, and the individual is therefore in the most dangerous condition as a focus of infection. A very small amount of sputum from such a case could, when dry, infect numerous others. Under the microscope such a specimen would be seen to swarm with millions of the bacilli. In some instances it may be necessary to use

force to remove such persons who are dangerous to the community but who refuse to go voluntarily to the hospital.

2. This group is a far larger one of ambulatory, moderately advanced consumptives, who, while incapable of regular work, yet enjoy a reasonable degree of health. For such as these permanent residence in a hospital is not suitable. They are able to do a certain amount of work, can therefore earn more or less money and for that reason are not as likely to be poverty-stricken as those in the first group. They can be taken care of in the sanatorium day-camps at a minimum of expense.

3. Many in the ambulatory stage, however, either have no homes or such as are entirely unsuited for their needs, and, besides the treatment furnished by the camp during the day, must have provision made for their care at night. This can best be done by use of the so-called "cottage hospital."

4. This is a miscellaneous group, the individuals of which are for various reasons unable or unwilling to leave their homes for treatment. If such patients properly carry out the directions given them much can be accomplished by home treatment under the supervision of the visiting nurse.

In taking care of the tuberculous of a city one of the prime necessities is the establishment of free dispensaries where the poor may go. Such dispensaries should be located in those parts of the city that are nearest and most accessible to the areas in which tuberculosis is most prevalent. In establishing dispensaries for the poor consideration should be given to the expense of car-fare and to the distance to be walked.

In such free clinics there should be a physician in charge, with assistant physicians, if the work warrants, and one or two nurses. Every patient who comes for treatment should receive a thorough physical examination. Very careful records should be made in order to use them for purposes of comparison during the course of the disease. It is in this respect that a properly conducted dispensary differs from a poorly conducted one. To be of the greatest value to all there must be such complete records that anyone can take up the work of the dispensary with full information at his immediate disposal concerning the patients. It is from such clinics alone that proper statistics can be obtained and correct conclusions drawn.

On the day following the first appearance at the dispensary the patient should be visited in his home by one of the dispensary nurses, who makes a special report concerning the social conditions. Disposition is made of the case as can best be done. If the patient is in an early stage, the sanatorium or day-camp is to be recommended; if he is far advanced he is sent to the hospital. If either of the above cannot be carried out the home-treatment is instituted. The patient must report at stated in-

ervals in order to record the progress of the condition. He is also repeatedly visited at his home. Medicine and food may have to be supplied by the city in many instances.

For those patients, who are in an advanced stage, special institutions must be erected as the general hospitals, very naturally, will not take them. It is a very urgent need to be provided for, as one patient in a dying condition is a danger point and should be removed to some place where he can be cared for properly. At the same time the family and the public are being protected.

Hospitals for such patients must be so arranged as to allow of their best care and also for the proper enforcement of precautionary and prophylactic measures. On account of the infectious nature of the disease there must be no places where dust and dirt can collect. All surfaces should be smooth and there should be no sharp corners. Plenty of light and air should be provided and sun parlors as well as a roof garden are essential. The roof of the hospital should be so arranged as to allow the placing of beds and other conveniences on it. A cover to protect in bad weather is a good thing to have, and the elevator, one large enough to accommodate at least one bed, should be so arranged as to permit of its going to the level of the roof.

The sanatorium day-camp is a valuable asset in the treating of the large group of the ambulatory tuberculous. It is little more than a small building for administrative and culinary purposes surrounded by wide porches; in short, it is an open-air hospital. The patients are required to report every day not later than 8:30 a. m., and at which time a record is made of the temperature and the pulse-rate. This is followed by breakfast, after which the patients rest or take outdoor exercise according to their condition. The subject of exercise is a very important one and should be taken only on the direct order of the physician since much harm can be done by too much exertion.

Dinner is at 12:30, following which all patients should be compelled to rest for an hour in a recumbent or semi-recumbent position.

At 4 p. m. the temperature is again recorded, a light supper is served at 4:30 and the patient then goes home.

For such of the above class as have no homes, the cottage hospital is employed. It is used merely to furnish sleeping accommodations and consequently does not require such an expenditure in building as does a hospital. The daily routine is the same as in the day-camp which should be immediately adjacent.

In addition to the control of those suffering from tuberculosis there must be rules and regulations for the prevention of the further spread of the disease made for the public institutions in which many people are congregated. Of these the prisons, the poor-house, hospitals for the insane and asylums of all kinds, are those in which tuberculosis must be fought. In the prisons, particularly, great care should be exercised as it

is in them that men are crowded together with a minimum amount of air and light. The conditions in some of the older penal institutions are such as to render them hotbeds of tuberculosis. Many a prisoner who has gone in healthy has come out infected and disabled, to fall later in life a further burden on the community.

Probably the most important regulation applicable to all times and places, is one against spitting. If people could learn to expectorate only in safe places, such as spittoons containing disinfectants, into paper cups that could be burnt or upon bits of gauze that could be destroyed, the most common method of disseminating tuberculosis would be wiped out. These regulations should prohibit spitting in all kinds of public conveyances, on the floors of all buildings, or on the sidewalks. The less sputum there is to become dried and pulverized, the less will be the respiratory troubles. Such regulations should be strictly enforced and there should be a fine sufficiently large so as to make it worth while to keep out of the courts. That the great majority of cases of tuberculosis are acquired by the inhalation of infected sputum is a fact that cannot be too widely known nor too much insisted on.

That such precautions as have been mentioned can bring about a tremendous decrease in the amount of the disease has been well shown. The making of sane regulations governing the safeguarding of the public health and the efficient carrying out of the same has produced wonderful results.

Dr. Biggs, the Health Officer of New York City, makes the following statement: "In New York City there has been a more rapid fall in the tuberculous death-rate than in any other great city in the world, and this notwithstanding the fact that the conditions in many respects are much more unfavorable because of the very dense population in the great tenement house districts of the city and the large element of foreign born population. It should be remembered that in no other city of the world is there such a density of population as exists in many of the wards of the Borough of Manhattan. In numerous districts on the East Side the population varies from six to eight hundred people to the acre, whereas the most densely populated districts of Paris, London, Vienna and Prague have only four hundred, or less, persons to the acre. When this fact is kept in mind, the difficulty in reaching the large foreign born element of the population, which speaks its native tongue and retains its native customs, will be appreciated.

During the past ten years there has been a decrease of 40 per cent. in the death-rate from pulmonary tuberculosis and tuberculous meningitis, these being the two forms of tuberculous disease in which an approximately accurate diagnosis is likely to be made. It is precisely in this, the youngest element of the population, that one would first look for definite results from the enforcement of measures for the restriction of this dis-

ease. There has also been a decrease in the total tuberculous death-rate between 1887 and 1902—a period of sixteen years—of 40 per cent.

When one takes into consideration what has been stated above, one can clearly perceive the great value of preventive medicine when applied to the preservation of the health of the country at large. If by making and enforcing methods for the carrying on of such work millions of dollars can be saved it is indeed well worthy of our endeavors. When we furthermore take into consideration the saving of sorrow and of suffering by reducing the death rate of any disease 40 per cent., there can be no discussion as to its being the greatest privilege of the physician to lend his aid in the advancement of the campaign against tuberculosis.

APPENDICITIS COMPLICATING TYPHOID FEVER, WITH
REMARKS ON INTESTINAL PERFORATION
DURING TYPHOID FEVER.*

By LOUIS M. WARFIELD, A. B., M. D., of Milwaukee.

During the past nine months there have been over 100 cases of typhoid fever at the Milwaukee County Hospital, in which a variety of complications has occurred. Two cases of appendicitis with operation and removal of the organ have occurred. The comparative infrequency of the coincidental appearances of the two diseases is the excuse for the following report.

Strange to say there is very little to be found in the best textbooks on the association of appendicitis and typhoid fever. Curschmann, in the monograph on Typhoid Fever in Nothnagel's "System" does not mention the subject. Dreschfeld in Allbutt's "System" says nothing about the association of the two diseases. In Osler's "System" McCrae devotes a page to a brief discussion of the subject. The appearance of the two diseases in the same individual at the same time must then be rather uncommon. The only reference, which could be found to a case somewhat similar to one here reported, is a note by Dr. Harvey Cushing in Vol. VIII. of the Johns Hopkins Hospital Reports. He mentions a case which on account of symptoms of perforation was explored. There was no perforation or peritonitis found. The symptoms were due to a chronic adherent appendix which was removed and was followed by subsidence of all the symptoms.

Case I.—C. N., a young white man, twenty-seven years old, entered the Milwaukee County Hospital on February 8th, 1910, complaining of ringing in the ears and deafness. He had always enjoyed excellent health up to his present illness except for a mild attack of influenza when twenty years old. His habits were good; he was an iron-worker and painter. Ordinarily his hearing was slightly defective.

His present illness began about seven days before entering hospital with malaise, loss of appetite, and headache. There were also severe pains all over the body. He lay around until February 7th, when he felt so ill that he went to bed. He had no nose-bleed, no herpes.

When he entered the hospital he was quite deaf in both ears. He had fever of 99° F., which in a few hours rose to 102.8° F. The chest and heart were normal. The abdomen was soft, appeared quite normal and the spleen could be felt easily. There were a few rose spots. The case

*From the Pathological Laboratory and Wards of the Milwaukee County Hospital, Wauwatosa, Wis.

was clearly a typical one of typhoid fever at the beginning of the second week. On February 9th he complained of a dull pain all over the abdomen, chest, and legs. Examination of the abdomen revealed nothing abnormal. The leucocytes were 19,000.

At twelve o'clock, midnight, February 10th, he suddenly developed a violent pain in the abdomen, and the temperature fell from 101.6° F. to 96.8° F., the pulse likewise decreasing in rate from 94 to 76. The respirations were not changed. He perspired freely. The abdomen was then not tense. He was given morphin by the interne and following that he passed a fairly comfortable night. He was not seen by me until 8:30 a. m., when the following note was made: The patient looks ill, the abdomen is slightly distended, the respiratory movements are seen only above the level of the umbilicus. The temperature is 98.6° F., pulse 104, respiration 22. The abdomen is everywhere tympanitic. The liver dulness is partially obliterated. On palpation the abdomen is tense, everywhere tender to pressure, but there seems to be more pain just below and to the right of the navel. No definite muscle spasm can be made out, but the rigidity is universal. There is no friction rub heard.

Although there was no muscle spasm, the extreme rigidity and general appearance of the patient strongly pointed to perforation so that an immediate laparotomy was advised. On opening the abdomen there was absolutely no peritonitis and no perforation could be found. The appendix was somewhat swollen, congested, rather long, and about the middle was curved to a right angle. It was removed and the skin incision closed without drainage. When the appendix was opened the mucous membrane was found to be congested, slightly thickened, and beneath it were scattered punctate hemorrhages. Microscopic sections showed the picture of a catarrhal appendicitis. There were no lesions characteristic of typhoid fever. The patient ran a mild course of fever. The day of operation the Widal reaction was positive in 1:50 dilution. By the 18th of February his temperature was normal. The leucocytes were 12,200. Examination of the ears revealed no cause for the deafness. As he grew better the hearing improved. Except for a slight recrudescence on March 5th, he had an uninterrupted convalescence and left the hospital quite well on April 7th, 1910.

Case II.—Adeline B., a white girl, single, twenty years old, entered the Milwaukee County Hospital on February 17th, 1910, complaining of pain in the side and fever. She has always been robust. Seven years ago she had scarlet fever and five years ago diphtheria. She has been subject to attacks of tonsillitis. The menstrual history was normal. She said that while washing clothes on the evening of February 14th, three days before admission, she was suddenly seized with a violent pain in her right side, she became nauseated and vomited. She had to go to bed, had fever and continual nausea. Up to the onset she was perfectly well, working every day. When she entered hospital she had temperature

of 103.5° F., pulse of 136 and respirations of 36 to the minute. She looked ill. There was pain, tenderness, rigidity and muscle spasm in the right iliac fossa, and there was the sensation on palpation of a mass in the appendix region. The leucocytes were 14,000 and the polymorphonuclears were above 80 per cent. The lungs and heart were normal. The condition was thought to demand immediate operation. A small incision was made in the right iliac fossa and an appendix exposed which was much distended and somewhat congested. There were no adhesions, no signs of peritonitis. In the ileum just above the cecum the surgeon called attention to a dark red spot which was thought to be an ulcer. The gut was thickened at that point. On removing the appendix the gas escaped and the organ collapsed. The wound was closed tightly. Following the operation the temperature fell to 100.5° F., but next day rose to 103.6° F., and from that time to her discharge she had a moderately severe typical attack of typhoid fever. On the 19th the leucocytes had fallen to 7,900. On the 18th typhoid bacilli were found in blood-culture, and there was a positive Widal reaction on the 21st. She made an uninterrupted recovery, the temperature reaching normal on the 21st day of illness.

Examination of the appendix showed that it was considerably congested, and scattered throughout the mucosa were spider-like hemorrhages. Microscopically there was swelling of the lymphoid tissue and areas of necrosis in the submucosa corresponding to the hemorrhages. There were no lesions which resembled those of typhoid fever.

These two cases are rather unique. In the first one there was every classical symptom and sign of a perforation, yet the whole condition was due to an appendicitis. Only one such case has been found similar to this one.

In the second case there was a definite association of appendicitis and typhoid fever. The sudden onset, pain, etc., with the leucocytosis was due undoubtedly to the appendiceal inflammation, yet when operation was performed, there were ulcers in the small intestine which certainly were due to typhoid fever.

There can be no doubt that at times acutely swollen lymph glands at the root of the mesentery in the early stages of typhoid fever may cause pain simulating appendicitis. Maurice Richardson has described such cases upon which he has operated.

In the association of appendicitis and typhoid fever McCrae makes five groups of the cases:—

Group I.—One may be mistaken for the other. As a rule the patient with typhoid fever is thought to have appendicitis.

As a matter of fact abdominal pain in the right iliac fossa is not rare in typhoid fever and mistakes could easily occur. The leucocyte-count is of material aid in the diagnosis. It is of particular importance to know the percentage of the polymorphonuclear cells in such cases. Occasionally

cases of appendicitis are thought to be typhoid fever. This may happen should a case be seen well along in the course when a small abscess has formed. The leucocyte-count, the Widal reaction, and blood-culture would assist in the diagnosis. I saw a case where a rectal examination revealed a fluctuating mass deep in the pelvis and cleared up the diagnosis.

Group II.—In this group are the cases in which there are specific typhoid lesions in the appendix.

Considering the fact that the appendix contains much lymphoid tissue it is not surprising that specific lesions occur there. Their frequency is entirely dependent upon the care with which they are sought. In the ordinary routine autopsy the appendix is not minutely examined unless some gross change is present. In 19 out of 105 autopsies at the Johns Hopkins Hospital ulceration was found (McCrae). Hopfenhausen (quoted by Hare) in an examination of thirty appendices from patients who died of typhoid fever, found changes consisting chiefly in cellular infiltration. Specific lesions were rare and were not severe enough to produce the more severe forms of appendicular disease.

Group III.—Perforation of a typhoid ulcer in the appendix.

This is a very rare occurrence and has no special symptom group other than that of perforation elsewhere in the intestine. There is a general impression that a perforation of the appendix would not be so apt to cause a general peritonitis on account of the anatomical position, there being every facility for localizing the peritonitis to the pelvic region. In this connection some statistics from the *Reports of the Johns Hopkins Hospital*, Vols. IV., V., and VIII., are of interest. Among the first 229 cases of typhoid fever there were two cases of perforation of the appendix, two ulcers being present in one case and one small ulcer in the other case. In the next series of 160 cases there was one case of perforated appendix. In Vol. VIII. J. M. T. Finney analyzed 829 cases and found perforation of the appendix in 5% of all cases, and in 79 collected cases of perforation of the bowel 3 cases were perforated appendices.

Group IV.—There are cases of acute appendicitis occurring with typhoid fever. These cases seem to be rare. At the Johns Hopkins Hospital there was only one case in McCrae's series.

Group V.—Lastly, there are some cases of appendicitis which occur after the typhoid fever which have been thought by some to be dependent on the fever, just as cholelithiasis is often traced to a typhoid infection.

Hare seems to think (and Keen likewise) that typhoid fever predisposes a person to appendicitis. But statistics do not prove this relationship. It must be a very uncommon one. Further studies must be made before we can accept this statement as probable.

My first case certainly belonged to Group IV. The man was in the midst of an attack of typhoid fever and developed an appendicitis with

leucocytosis and with an appendix which on microscopical examination showed none of the lesions of typhoid fever but those of catarrhal appendicitis. Were I to see another case such as he, I should again unhesitatingly diagnose perforation.

The other case does not fit any of the groups mentioned above. There was an actual association of the two diseases. It comes nearest to the first group. She had a marked leucocytosis, an acute appendicitis and typhoid ulcers at the same time. Certainly this association must be most rare.

It will be admitted that the diagnosis of recent perforation in typhoid fever is most difficult but not impossible in a large proportion of the cases. The points to be particularly emphasized are the following. First, pain, sharp, sudden, agonizing, so that the patient, as a rule, cries out and, if asleep, wakes up with a cry. The pain may come on at any time of day or night and previous hemorrhage by no means always occurs. The pain is around the navel and may be located soon at one spot near the navel, in my experience usually a short distance below and to the right side of the navel.

Second, muscular rigidity on the side of the perforation. This is particularly noticeable in the rectus muscle. The effort on the part of the patient to protect the abdominal viscera causes an involuntary tightening of the whole musculature on the side where the peritonitis is beginning. This causes not only rigidity, tenseness of the muscles, but also interferes with the free abdominal respiration and consequently close inspection will reveal limitation of motion not only below the umbilicus, but frequently on the affected side only.

Third, local muscle spasm and local tenderness immediately over the perforated spot. A further attempt to protect the injured spot is the local spasm. The rectus may be fairly rigid throughout its length except at one spot possibly not more than 5-6 cm. in diameter where palpation reveals not only a tense muscle but actual sudden contraction of a small section of the muscle. This point I consider most important. One also finds that when the pressure of the palpating hand is suddenly released there is often a sharp pain. This sign has been described in the diagnosis of peritoneal inflammation around an appendix.

Pain, muscle rigidity, muscle spasm are a triad sufficient to demand an immediate laparotomy. Pain alone is suspicious, pain and rigidity more suspicious, pain, rigidity and spasm most suspicious. What if on opening the abdomen there is no perforation found? No patient's chance for recovery has been, in my experience, materially lessened by a laparotomy quickly performed. Certainly if the abdomen is not opened and the peritonitis surgically treated the patient will almost surely die. It is better to do an operation on a patient who has no perforation than to neglect to do one on a patient who has a perforation. Ether anesthesia has been used when the patient had a severe bronchitis. Local anesthesia has been

successfully employed. The present-day nitrous oxide anesthesia is probably the best, as the shock to the patient is minimal and sleep is profound enabling the surgeon to operate in a completely relaxed abdomen.

Such symptoms as sudden drop in the temperature, sudden change in the pulse rate, increase of respirations had better be neglected. They are unimportant and by no means always occur. The leucocyte count may be valuable but I confess that it has never given me one iota of assistance. Absence of liver dulness, anxious expression, board-like abdomen are not symptoms of early perforation but those of general, diffuse, fatal peritonitis. To wait for these symptoms is to sign the death warrant of the patient.

I am perfectly convinced that many a patient has died of a general peritonitis starting from a perforated ulcer because there was too minute an examination of the nursing chart and not minute, painstaking examination of the abdomen.

Typhoid fever is unfortunately still with us, it occasionally breaks out in epidemic proportions, and it behooves us to watch most carefully the patients who come under our care for the many accidents which may happen during the course of the disease. None of these accidents is so grave in its consequences as intestinal perforation.

TRYPANOSOMIASIS IN THE BELGIAN CONGO.

By LEON HOLLEBEKE, M. D., of Brussels, Belgium,
Physician of the First Class to the Independent State of the Congo.

Sleeping sickness, which is ravaging the entire extent of the Belgian Congo Colony, appears to have been known for a long time in Central Africa.

In Kwango old men tell me that they were familiar with it in their youth. But as my informants had only a vague recollection of it, I have been unable to fix the date of its first appearance, or ascertain the degree of virulence of former epidemics.

Since the general epidemic in 1899, however, the natives around Lake Leopold II., a region adjacent to the mouth of the Kwango, recognize and correctly "label" the disease, even before the symptoms of sleep make their appearance; and even in cases where the whites failed to identify it.

It is, therefore, not unfair to assume that sleeping sickness has been known, in those districts, at least fifty or sixty years,—the age of those, who remember it from their early youth.

I shall not digress to the history of this malady which in so remarkably short a time has assumed such terrible proportions, more especially on the West Coast of Africa, where it has existed for many years in an endemic form. Suffice it to state that reports from the interior indicate its spread over the entire continent.

In the Congo,—the point of interest here,—the malady certainly existed in the year 1890, and thence spread to the interior. The Cataract District was notably affected; and in 1895 cases were reported from Leopoldville. In 1896, at Kwansouth, where the Kansai river empties into the Congo, an entire Catholic mission in a flourishing condition was wiped out by the epidemic; so much so that the priests, who had conducted it, were compelled to abandon it and move further inland, in the hope of being able to aid, from their new location, in stamping out the pest.

At about the same time reports from all surrounding districts indicated a general epidemic throughout Central Africa. In fact the report of Doctors Todd, Dutton, and Christy, in 1896, mentioned only a very small section of the Kasai District as unscathed.

During my stay at Leopoldville, from 1894 to 1896, the number of blacks seized by that disease,—which then was invariably fatal,—reached 60 to 70 per cent.

Among the blacks who came from various parts along the Congo to

offer their services as soldiers or workmen, I noticed from 5 to 10 per cent. that became affected. They, however, had undergone a medical examination before being allowed to leave home.

On my last voyage, 1907 to 1909, I visited successively a portion of the Kasai, the Lomami and the Manjema. Everywhere I found cases of trypanosomiasis; and where I was able to make adequate investigation, I found that 50 per cent. of the blacks were affected.

In the beginning it appeared that the disease spared the whites; so much so, that they were considered immune. But ever since 1903 Manson, Broden, Brumpton, Todd, Dutton and Christy, one after the other, reported cases of trypanosomiasis among the Europeans. I myself, from May to August, 1906, treated 6 cases among the whites. Since then the number has become many times multiplied; and many a white man has already paid the final tribute to this malady.

I shall not here trouble you with the pathogenesis of this disease. That is well enough known; therefore I shall endeavor to give as complete a picture of the disease as my personal observations will enable me to render.

I might say right here that this disease has been improperly divided into two stages or periods. It has three distinct stages:—

- (1) Great febrile oscillations.
- (2) Hectic fevers, and nervous derangements.
- (3) The sleep proper, ending in death.

First Stage.—The most important manifestation of this period is the fever. It is in the nature of bilious fever, with exacerbations at night, and reaches, or surpasses, 40° C.; thus strongly reminding one of bilious malarial fever. The patient is seized with absolute anorexia and vomiting. This fever lasts three, four and even fifteen days. It then disappears, and the patient feels, to all intents, well and strong; and apparently is so, only that there are night exacerbations, so slight, though, that he himself rarely takes note of them.

Quinine, by injection or by the mouth, has absolutely no effect on this fever. This fact eliminates from the diagnosis all possibility of malaria. This exclusion effected, pass your finger over the sterno-cleido-mastoid triangle in the neck, and if you find a plexus there of small, indurated ganglia, easily shifting under the finger, think at once of trypanosomiasis.

I would call special attention to the shape of these ganglia. In syphilis they are flat, hard, of the shape of a lentil, especially in the nape of the neck. In filariasis they are less numerous and individually larger, sometimes reaching the size of an olive (rather less).

A microscopical examination of the lymph is advisable, as it is not of infrequent occurrence that filariasis co-exists with trypanosomiasis. In the latter, as already stated, the ganglia are small and never exceed the size of a pea. They are rounded in shape, numerous, easily mobile under the finger, and invariably painless.

An important symptom, discovered by Broden, is the acceleration of the pulse, the number of beats per minute varying from 90 to 120 and over; but full, regular, and measured.

I have often noticed epistaxis and even hemophilia. The slightest scratch bleeds freely, due, no doubt, to a hypertension of the blood from acceleration, which, in turn is due to an alteration in the nerve centres; or indeed the composition of the blood is so changed, that the nerve-ganglia of the heart become abnormally excited. Is the blood, perhaps, impoverished in coagulant elements? That question I have not thought to solve, as I have at my disposal here neither instruments nor proper reactives.

In 1907 I called attention to another valuable symptom, more especially for popular diagnosis,—a symptom which I consider pathognomonic. Unfortunately I have noticed it in the white man only; and then not invariably. It is a cutaneous eruption of quite a specific form, not to be found, I think, in any other disease.

It presents itself in an oval or round spot that grows to the size of a one or two franc piece. The rim is about one centimetre broad (sometimes broader), of a red-purplish color, disappears under pressure, has no appreciable "shoulder" or elevation, either to the eye or the touch. Its centre is healthy skin. I have never noticed desquamation; and the patient complains of no subjective phenomena, with the exception of a very slight itching at times. This eruption usually appears at the sides of the thorax, but spreads rapidly over the entire trunk and limbs. Meanwhile the individual lesions grow in size, and even run together, so that the body presents a purple appearance, with, here and there, an island, as it were, of sound skin. The eruption eventually disappears without leaving a trace.

As a secondary initial symptom may be mentioned neuralgic or rheumatic pains in the head, in the kidneys, and in the limbs. In fact, so nearly do these pains simulate rheumatism, that the diagnostician, if not forewarned, might consider the co-existing eruption as of rheumatic origin.

These are the symptoms of the first stage. Blacks sometimes do not complain of fever; the thermometer, however, will always indicate from 37.3 to 37.8° C. If there is acceleration of the pulse, and if there is present the ganglionic hardening already referred to, examinations of the lymph will be indicated.

I have dilated on the symptomatology of the first stage, because the disease in that stage is curable; a fact of the greatest importance which should not be overlooked.* This stage may last from a few months to several years.

*During the first stage the parasite can be found with ease in the peripheral circulation; hence, it is in this stage that a patient transmits the disease most readily to others. On account of this the disease should be recognized as soon as possible.

Second Stage.—The transition from the first to the second stage may be either almost imperceptible or abrupt. In the former case a gradual change is noticed in the patient; instead of being an industrious worker, he becomes lazy, careless and negligent. He seems very easily fatigued, even on slight exertion; voluntary, habitual isolation is marked, and a tendency to somnolence is noticeable.

His general health seems not to have undergone any alteration; perhaps there is a slight diminution in weight; perhaps, on the contrary, there is enough bloating to resemble the taking on of flesh. There is now a febrile condition not exceeding 38.5° C.

The process takes so characteristic a course, that it is recognizable from afar; the eye becomes more glassy, the upper lid falls in a manner to give the appearance of an almond-shaped slit, and the dry skin is grayish in the black and earthen-yellowish in the white man. The functions of the organs are regular, though the reflexes may be exaggerated.

In the latter case there is an extremely nervous condition, sometimes with access of insanity. The patient cannot remain in one place, and sleeps less than before. He is quarrelsome in the extreme, sings, talks volubly, and prevents those about him from sleeping. The indicia of insanity may appear at once; at any rate, their arrival is not delayed for long. There are certainly singular manias that characterize this stage; the most frequent one which I have noticed being that of setting fire to a house. Again I have noticed full-fledged bulimia; a negro would, for instance, eat, in one day, an entire kid. The mania of persecution also is of frequent occurrence. Under any condition the patient must be segregated so that he can do no harm.

At this stage death may supervene from a convulsion (epileptiform) or from an acute attack of any disease.

Third Stage.—If the second period has not been cut short by intervening death, the sickness enters, after from one to seven months, upon the third stage—actual sleep.

This stage rarely lasts longer than three months, and a much shorter time in those whose nerves are affected, as above described.

The patient is in a state of torpor, and sleeps practically all day. He must be awakened to induce him to take nourishment; and unless he is closely watched he will fall asleep while in the act of eating. His weakness grows apace; the reflexes are abolished, and all sensibility is destroyed. I have seen a black in so profound a sleep that he was not awakened by the burning of his hand. Another instance indicative of extreme somnolence was a case in which the gnawing of rats at a patient's feet did not incommode him in the least. In this stage the loss of flesh is excessive and soon the patient resembles a living skeleton. When this condition is reached the fever abates, the temperature becoming subnormal— 34 to 35° C. Shortly after death ensues.

This, then, is the malady which threatens to annihilate the black race, in case its progress is not stopped. But there are measures to compass this end.

Foremost among the means that have been praised is a quarantine-hospital arrangement for isolation as well as for treatment. This is an excellent measure, but not practicable except in large centres. More practicable are tent-lazarets near every aggregation of natives, which should be under the management of competent nurses, capable of diagnosing a case and giving atoxyl injections. A physician must regulate these lazarets by frequent visits, so as to prevent abuses and maintain their efficiency. Posts of surveillance are already established for the purpose of preventing those from infected neighborhoods entering healthy spots and vice versa; and these are in efficient operation, thanks to the devotion of the local physicians.

There exists an ordinance in the villages prescribing absolute cleanliness, and the removal and destruction of all species of accumulated filth. This ordinance further insists on the cutting down of all underbrush within five hundred metres from the limits of the corporation.

This also is an excellent measure, but requires too much watchfulness, and is impracticable of enforcement.

In other places there is a regulation,—especially in parts near the sea shore,—in virtue of which a patient suffering from this disease is transported in a vehicle covered all around with a close mesh made of wire, to prevent insect-bites. The vehicle takes the patient to the shore and from there he is taken, in a similar cage, to a steamer lying off the land. I have not had the opportunity of seeing such a conveyance. It seems to me, though, that lazarets, as above detailed, would do away with the need of transporting the patient, whose end is, I understand, usually hastened by the fatigue incident to the trip.

The heads of the surveillance-posts are compelled to periodically examine the personnel of the posts, and also the neighboring natives. If there be a suspected case of trypanosomiasis, it is at once segregated and sent to the post-lazaret. This excellent ordinance has, however, remained a dead letter.

Koch has lauded the destruction of crocodiles and their eggs; they are, in his opinion, the most competent and prolific purveyors of food for the *Glossina palpalis*. Besides the crocodiles there are thousands and one kinds of game that purvey food for that fly. Hence the fly should be exterminated; but even if this were effected there are still the human beings to spread the contagion.

The point of attack should be the destruction of the larvæ of the *Glossina*. It would appear, a priori, that they are more easily accessible.

It is known, for instance, that the larva buries itself in the ground to the depth of a centimetre. Absence of humidity, or too much heat prevents its development. Therefore cut down the underbrush and let the direct rays of the sun do their work on the denuded ground.

Another means might be,—on the lines of Dr. Koch's recommendations,—to somehow persuade or induce the blacks to put more clothes on their bodies, or furnish clothes for those that cannot otherwise procure them. By that means the surface for bites would be diminished, and, as a corollary, the number of infections, the number of flies from diminished food-supply, etc.

Is there a prophylactic? Until now research in that direction has been futile. I suggest injection of atoxyl in healthy exposed persons; and, while that might not prevent the lodging in the blood of the parasite, it would decrease their number in the blood, as it would destroy them as soon as they entered. In fact, it would have the same effect that quinine has as a prophylactic against malarial parasites.

As for the treatment, many remedies have been lauded, yet none has given satisfaction.

Arsenic and its compounds, Trypanoth, the colors, emetics, atoxyl,—all these have had their turn.

In my own opinion, atoxyl has had the most favorable results. The inconvenient part of it is that it must be administered by way of injection, a method against which the natives forcibly rebel. But what does that amount to, when we consider the great good it does?

It has been administered in various ways: some prefer large doses (from 1 to 1.5 gr.) repeated every seven or eight days; others use 50 cgr. twenty-four hours apart, and repeat that treatment every week.

I have given daily injections in increasing and decreasing doses, beginning with 15 cgr. and then giving 30 cgr. and even more. The results were excellent, and I have never noted symptoms of intoxication.

Which is the best plan? All I can say is that my patients (some already in advanced stages) are doing well. One of them who weighed (September, 1903), only 49 kg., is now married and has two fine children. He has received no treatment since 1903, and now weighs 80 kg. He is getting ready to come back to Africa.

Is the disease curable? I firmly believe that it is, at least during the first and a large portion of the second stages, before the lesions in the nerve system have become too deep-seated.

Investigation, though, is still too incipient to allow of a definite reply.

Arsenic will no doubt eventually solve the problem; and it is devoutly to be hoped that a specific remedy will shortly be found to combat this most insidious and disastrous disease, which threatens to wipe the black man from the face of the earth.

THEORETICAL CONSIDERATIONS, PRACTICAL APPLICATIONS AND RESULTS OF CARL SPENGLER'S "I. K." IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

By OSCAR H. BENKER, M. D., of St. Louis.

In September, 1908, Carl Spengler, one of the foremost pupils of Robert Koch, announced that he had discovered in the red blood-corpuscles the main producing units of immune substances, and that these immune substances were present in the erythrocytes in a million times greater quantity than in the corresponding serum. He produced accordingly from immunized rabbits, later from rams, a tubercular immune blood containing one million antitoxic and lytic units to the c.cm. This immune blood he called "I. K." (*Immun Koerper*). The lytic and antitoxic units were extracted from the red blood-cells in pure form, giving a lyso-antitoxin in which the hemoglobin as well as all albuminous substances were eliminated. The danger of anaphylaxis, so common a result from other antitoxins, was entirely removed. According to Carl Spengler, this lyso-antitoxin would, after introduction into the circulation, act bacterio-lytic; that is break down the enclosing membrane of the tubercle bacilli, liberating the toxins, and binding the latter through its antitoxic units. It was especially recommended in the severer forms of pulmonary tuberculosis, in the cases in which our active immunizing agent, tuberculin, was contraindicated.

The first sign of the "I. K." effect in tuberculous patients, this being Carl Spengler's own description, consists in the improvement of the subjective state, and in freer respiration, should this have been impeded. Generally the first few injections are followed by an improvement in the appetite, and the majority of the patients rapidly increase in weight. In the main, it is a question of after-effects of the "bactericidal method" with freeing from poison (antitoxin effect). At the same time the fever temperature is lowered, or fever that continues assumes the character of aseptic fever. There generally ensues, in the first few weeks of the "I. K." treatment, a rapid, but occasionally in the commencement, a fluctuating diminution in the number of tubercle bacilli, and a continual decrease in the rhonchi and sputum.

What brilliant results would one not expect from the above words, had not hard experience taught us how formidable a foe tuberculosis is in its advanced stage! Our best results in the treatment of tuberculosis had been obtained through an active immunizing agent and entirely on dif-

ferent theories, as lately elaborated by von Pirquet, Sahli, and Wolff-Eisner. To understand more clearly the reversal of the present theories through Carl Spengler's new field of cellular immunity, I will briefly state our present theoretical view, as to the production of tubercular immunity through tuberculin action. The tuberculin injected into the circulation of a tuberculous patient is at once lysinated or digested through the tuberculo-lysins of the system. This lysinated tuberculin becomes more toxic and in return stimulates the system to the production of antibodies. It further stimulates the circulation through or near the diseased tissues, increasing the blood-supply, and bringing into play the natural immunizing agents of the organism, such as the blood-plates, leucocytes, the serum, etc.

Next the slowly increasing doses of tuberculin bring about a gradual tolerance to the tubercular toxins; and thus is made clear to us how complex the production of tubercular immunity is. "I. K." will do all this by means of two simple processes: lysinating or breaking up the tubercle bacilli and binding their toxin.

The directions for its use is as follows:—

First the dilutions are made in the decimal scale from Dil. I. to VII.

The treatment should begin with No. V.; rarely with Nos. VI. or VII. After the first injection it is advisable to prolong the interval from ten to fourteen days. After that the doses can be increased more rapidly and injections consisting of doses increased from ten to one hundred times can be given within intervals of from four to eight days. Of course definite directions cannot be laid down, as the individual reaction to "I. K." must constitute the chief guide up to the present.

I have treated 14 cases of pulmonary tuberculosis, classified according to the international classification: 6 cases in stage I.; 2 cases in stage II.; and 6 cases in stage III. Out of 6 cases in stage I., 2 were distinctly benefited by the reduction in both cases of a temperature of 101-102 F., which had lasted over four weeks, to normal. The destructive process in the lungs was completely arrested, one case gaining several pounds during the treatment; 3 cases were not influenced in the least. Later a course of Beraneck's tuberculin, Sahli's method, arrested the process in all 3 cases; and 1 case was decidedly aggravated, producing a slight rise in temperature after each injection, an increase in the rhonchi, and even slight hemoptysis. "I. K." was accordingly discontinued and Beraneck's tuberculin substituted, but with no result. No tubercle bacilli were present in the sputum of all these cases before or after treatment.

Case No. 1 in stage II. improved considerably in the subjective state, the lung process slightly improving and the tubercle bacilli disappearing from the sputum. In case No. 2 the subjective state was aggravated as well as the lung process. The temperature increased from 100 to 102 F. The sputum showed no change either in appearance, quantity or bac-

terial contents. The 6 cases in stage III. died. The lung process grew progressively worse. The sputum did not show the slightest changes, though 3 cases were ameliorated in the subjective state.

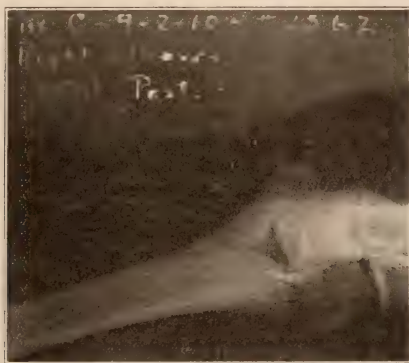
It will readily be seen from the above cases that the pronounced effects claimed failed to materialize. However, both a lytic and antitoxic effect from "I. K." manifested itself in a number of cases. It would seem, therefore, that the production of a more potent lyso-antitoxin against tuberculosis is desirable, and that Carl Spengler has opened up a new field of research, which, if carefully followed, promises to give us a strong weapon to combat tuberculosis in its advanced stages.

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X-RAY INK.

By E. H. SKINNER, M. D., of Kansas City.

All *x*-ray negatives should possess some distinguishing mark for identification and cataloguing. The matching of finished, developed negatives to case history cannot be further tolerated. There is no accuracy or surety, and too much latitude of probability.



Reproduction of original elbow negative. The *x*-ray ink is opaque to the *x*-ray; therefore, there is no action of the *x*-ray upon the part of the plate covered by the *x*-ray ink. This negative displays the name, date, number, part of body and position of part, upon the edge of the negative near the shadows of the bones of the elbow. The writing was made with the usual stub pen (No. 313, Esterbrook Probate Pen).

A means of identification should possess the following:—

- (1) Opacity to the *x*-ray; that such opaque figures or letters may be impressed upon the film at the time the exposure is made.
- (2) The figures or letters should correspond to the name and number of the patient upon the negative record of the roentgenologist.
- (3) The figures or letters should serve to identify the plate to any layman, so that when presented to a jury there may be no doubt or surmise, or necessity for the introduction of the roentgenologist's record book into court.

(4) Such letters or figures should be easily handled, inexpensive, and not easily lost or misplaced.

Many methods and devices are offered that serve to prevent confusion. For many years we have been content to place lead letters upon the envelope or cassette at the time of exposure. These letters correspond to the roentgenologist's negative record. This method has been elaborated by several manufacturers, who have devised indicators with three or four revolving discs, each disc containing the numbers 1 to 10 perforated in the outer edge, and above or below the disc was the stenciled name of the roentgenologist or laboratory. Another simple device is the use of foundry lead letters, 3/16 inch Gothic type. These may be attached and detached easily to adhesive plaster. This permits the addition of such letters as *A, B, C*, etc., to indicate a series of negatives in a given case, or such indicators as *Post., Ant., Lat., R., L.*, which are abbreviated from posterior, anterior, lateral, right and left, respectively. There are many ingenious devices for attaching these lead letters to the unexposed plate; a spring-clip that will slip over the edge of the plate and automatically hold itself in place, with the lead letters placed upon adhesive around one of the wings of the spring. Another method of marking plates consists of printing with a small stick upon the plate envelopes with a bismuth paste or emulsion. This method is not practical, as it consumes time in printing and the emulsion dries slowly.

These devices all have their faults; the lead letters and stencils are easily lost; they may be confused or mistaken when applied to the plate; they do not absolutely identify unless an unwarranted amount of lead type is kept in stock, and then one must refer to the roentgenologist's record. Therefore, we must possess a substance which is roentgenologically opaque, which can be used with ease and speed, which does not require tedious adjusting or reference to records, and cannot be lost. We have such a substance in *x-ray ink*.

This *x-ray ink* can be used with the ordinary pen. The name, number, position, date and operator's signature may be written in the corner of the plate-envelope, and every scratch of the pen will be legibly reproduced upon the negative. The substance is in suspension and must be shaken to bring the opaque crystals upon the pen-point. It is conveniently kept in a dropper bottle, into the neck of which a cork-covered penholder will fit and prevent any loss or inconvenience while shaking the bottle. The substance is cheap, and will last indefinitely.

Such an *x-ray ink* will prove of inestimable value in medico-legal practice, where negatives must be exhibited to a judge and jury. Such negatives will have indelibly impressed upon them the name, age, part and position of body, date, and signature of the roentgenologist, and there may also be added the signature of a representative of the parties to the controversy. There will be absolutely no chance of confusing,

mistaking, misrepresenting or exchanging plates. If a consulting roentgenologist is called upon either side of the case it will be easy and convenient for him to render an opinion upon the negative, as the data will be legible.

Aside from the medico-legal aspect of this *x*-ray ink, we may readily see how convenient it will be for the alphabetical or numerical filing of plates. There is no chance of a mistake, such as duplication of numbers, as the name and date would also serve to identify. Where plates of both extremities are required the advantage of the *x*-ray ink cannot be surpassed. One can write upon the plate-envelope, "right leg" or "left elbow" and the position during exposure. Recently the author was called upon to give an opinion in court upon negatives of the right and left elbows, both of which were reputed to have sustained fractures to the radial head. The only means of identification was the roentgenologist's inscription placed upon the plates after development. It takes an acute interpretation to identify four pictures of two elbows, without some opaque identification impressed upon the negative at the time of exposure. The best one could opine was that the negatives were of elbows and, while two of them indicated fracture and two did not, it was impossible to state that they indicated a fracture of each radial head or were negatives of the case in question. If the roentgenologist is confused in his identification, imagine the idea of exactness that the lay juror obtains.

In study and research of specimens in a roentgen laboratory, the *x*-ray ink proves of great service. We may desire to take several negatives upon one plate, and be able to identify the exposure and position with accuracy. Inscribing these data upon the plate-envelope previous to exposure, will give us permanent, indelible identification. Recently, in the study of the radiographic relation of the femoral trochanters in varying foot positions, we made two exposures upon a plate and indicated them thus: "Foot at angle of 45 degrees to table" and "Foot vertical to table."

This *x*-ray ink may be obtained from roentgen manufacturers at reasonable prices. It is best used with a stub pen and cork-tipped penholder. The desired words may be written upon the usual *x*-ray envelope or cassette, or upon a piece of paper which is laid upon the envelope. By the latter method the paper inscription may be exposed in the reverse position so that the print or photographic reproduction will be read as written and not reversed. The bottle must be shaken because the suspension is in water which does not sustain the opaque material for any length of time. The water dries rapidly after writing, leaving the opaque crystals upon the paper.

ADVANTAGES OF LOCAL CARE AND TREATMENT OF TUBERCULOSIS.

By LAWRENCE F. FLICK, M. D., of Philadelphia.

The best outlook for the Tuberculosis Crusade is the extermination of tuberculosis. That the disease can be wiped out cannot be doubted by anyone who understands it and has given thought to the subject. The task, moreover, is a relatively easy one if undertaken with knowledge and forethought.

The cure of tuberculosis is a more inviting field than the prevention but is less profitable to society and, perhaps, even to humanity. Making a person who is sick, well is much more dramatic than preventing a person from getting sick, and is much more fascinating to the average mind. This is probably because the factors and elements which enter into the cure of a case are concrete and can be much easier seen and weighed by the mind, whilst the factors and elements which enter into the prevention of a case are somewhat abstract and must be left to the imagination. In other words, you see the individual whom you cure; he appeals to your sympathy, and you have the living evidence before you of the good work which you do; whilst a case which is prevented may be someone whom you will never know or hear of, and of whose existence you will have no clear knowledge.

Apparently, the advantage is entirely with curative effort and yet, when all the factors bearing upon the whole subject are considered and a careful analysis is made of them, the mind sees clearly that prevention is more effective and more valuable than cure. It will come out very clearly in such an analysis that more lives can be saved by prevention than by cure. The only thing which cannot be done, and it is this which no doubt makes it difficult for the ordinary mind to grasp the value of prevention, is to point out the individuals whose lives are saved by prevention and use them as concrete evidence of what has been accomplished.

This, too, in spite of the fact that tuberculosis is now curable! Until very recently, the cure of tuberculosis was believed to be nearly impossible and to occur very rarely. Advancement in scientific knowledge and improvement in the technique in treating tuberculous individuals, however, have taken tuberculosis out of the category of diseases which may be looked upon as incurable. In a relative sense, nearly all incipient cases and many advanced cases can now be cured. The word "cured," however, must be used only relatively, and not in the same sense in which it is used in other diseases which run an acute course. In no cured case of tuber-

culosis is there a definite certainty that relapse may not occur, not even in those cases in which perfect health has been regained and has been enjoyed for years. There is always the possibility of an ultimate death from the disease and of new implantations of the disease in others during the terminal stage of the disease's course. In recoveries of persons in whom the disease is more advanced, relapse is of frequent occurrence, and even when relapse of a fatal character does not occur, a condition may arise in which the disease has again become contagious. Recovery from advanced tuberculosis usually can only be maintained by perpetual care, and the preventive value of such a recovery, in that the individual by recovery is made non-contagious, can only be maintained so long as relapse of the disease is prevented, or at least, as the individual is made to follow practices which guard against new implantations.

A life which is saved by the prevention of a new implantation, on the other hand, is a life saved for good and for all, so far as tuberculosis is concerned; and the saving of this life has as its sequence, an indefinite series of preventions in progressive ratio for all time to come. The person who has never received an implantation of tuberculosis, it goes without saying, can never be afflicted with any of its ravages and burdens and cannot transmit the disease to others*. Such a life, while not known to us, must nevertheless contribute its value to our social fabric and our civilization. From the very nature of things, it must be of more value than the life of the cured case, even when that case is completely cured and does not have a relapse.

In addition to what we save in life by the prevention of tuberculosis, we save much to society in what is obviated in damage to individuals and to families from the burdens and injuries which come from the disease and with the disease. The majority of those who recover from tuberculosis go through life with a serious handicap, physical, mental, and social. Nearly all families in which the disease has existed have been injured financially, physically, and socially. It is this indirect damage of tuberculosis which is really most costly to society and which has always been a serious barrier to civilization. With prevention, all of this indirect damage is obviated.

In view of the greater advantage which comes from prevention over that which comes from cure, prevention should be the first aim in the Crusade against Tuberculosis. Where resources are limited, they should first be applied to those measures which give the best return in prevention. Other measures should be secondary, and should be introduced only in proportion as they are necessary for the accomplishment of prevention and with resources that can be spared from this.

The best measure for the prevention of tuberculosis undoubtedly is the care of advanced and of acutely ill cases. Tuberculosis in other stages than the advanced stage and in other conditions than the acute condition are frequently not contagious at all, and when they are con-

tagious, are not contagious enough to produce a competent contagious environment, that is, an environment capable of giving a new implantation. Ordinarily, such an environment is found in an enclosure which has been inhabited continuously by an advanced or an acutely ill consumptive for a long enough time to contaminate the floors, walls, furniture, and various contents of the enclosure with tubercle-bearing matter to such a degree, that others occupying that enclosure may take in the tubercle-bearing matter continuously in sufficient quantity to overcome their resistance. The homes of dying consumptives and the workshops in which chronic advanced cases try to eke out a living constitute vastly the majority of competent contagious environments. These are the places, therefore, about which the Tuberculosis Crusade should be concerned and in which infection should be prevented.

In the work-shop, the chronic consumptive can make himself harmless to his fellow-workmen by always and under all circumstances expectorating into a cup which he holds close to his mouth, then wiping his lips with a paper napkin, folding the paper napkin and depositing it in a paper-bag, and burning the sputum cup, paper napkin, and paper-bag before any of the matter with which they are polluted can escape from them. Nothing short of such a practice will make such an employe harmless; and such a practice will make him absolutely harmless. So far as this class of cases is concerned, the Crusade against Tuberculosis should, therefore, see to it that every coughing and spitting workman or workwoman is supplied with the proper commodities for disposing of his sputum in this way, and that he uses these commodities at all times and under all conditions. A good way to do this is for all coughers and spitters, whether they have tuberculosis or not, to do the same thing, and for society to make it fashionable to dispose of expectorated matter in this way.

For the advanced dying consumptive, and for acutely ill consumptives, it is necessary either to patrol him with competent nurses in his home or in a hospital near his home. Towards the end of the disease, the consumptive becomes mentally and physically helpless, so that he himself can do little for the protection of others. For him to follow practices which do away with all possibility of contamination of his environment, it is necessary that he should be under the supervision of a competent nurse day and night and that his linens be promptly changed every time he pollutes them. To give such supervision to each patient in his own home is not possible. Such supervision, however, can be given in a hospital near the home of the patient at a cost which is not prohibitive. Acutely ill consumptives should also be treated in hospitals, as in their homes, under nurses.

As a matter of economy, every community should take care of its own advanced consumptives and of its consumptives in an acute active stage of the disease within its own governmental confines. This saves cost of transportation, and makes it easier to induce those who are afflicted

with the disease to enter institutions. The poor cannot afford to travel long distances to see their afflicted relatives and are unwilling to let them go beyond reach of visitation at short intervals. This particularly applies to dying cases. When the opportunity is given to such cases to enter an institution within walking distance of members of their family, they enter cheerfully and remain until death calls them. When they are induced to enter institutions far from home, which they can be in the hope of recovery, they almost invariably insist upon returning home as soon as it becomes evident that they are going to die, and in this way, by polluting their homes within the last few weeks of life, they neutralize practically all that has been done for them by these institutions, at least, in the way of protecting others.

Undoubtedly, the most economical method for a community to deal with the problem of caring for advanced and acutely ill consumptives is to adapt and equip existing hospitals for the care and treatment of such cases. Any hospital can, with modern methods, equip itself for the care of consumptives at a small outlay of money in a way that will make it entirely safe and practicable to treat the consumptive under the same roof with people suffering from other diseases, without the slightest danger to them or to the employes of the hospital. There are, at present, more hospital beds in existence than are needed for patients suffering from acute diseases, and the idle beds add very much to the cost of maintenance. With good management, a hospital can be run from ninety-five to ninety-eight per cent. full, and when it is run in this way, the cost of maintenance per capita goes down very materially. Unfortunately, a strong prejudice has grown up in hospital management against the admission of people suffering from certain diseases, of which, consumption is perhaps the most conspicuous, and managers will rather run their institutions with half their beds empty than admit cases against which they have this prejudice. This is both bad management and bad philanthropy.

A hospital which, at the present day, persists in excluding certain diseases from its beds, unless it be the very acutely contagious diseases, such as smallpox and a few others, on the ground of contagion, thereby confesses incompetency on the part of its management and admits the existence of conditions within its walls which are not up to the modern standard of hospital equipment. The Pasteur Institute has shown that with our modern scientific knowledge it is possible to treat even such cases as smallpox in a general hospital located in the built-up portion of a city without danger to anyone. What the Pasteur Institute has done for years could be done by any modern hospital, and while it might not be advisable at present, to go as far in these matters as the Pasteur Institute has gone, the time must come in the near future, when Municipalities, Commonwealths, and even corporations conducting hospitals for charity's sake, will see the great waste in keeping hospital beds empty and will so equip themselves that they can take care of any sick person

suffering from any disease whatsoever, without any danger to anyone else from contagion or infection.

Where hospitals cannot be persuaded to equip themselves for the care of advanced and acutely ill consumptives, small inexpensive hospitals for the care of such cases should be established in every community in such places as are readily accessible to the people. It is better to have a large number of small hospitals for this purpose than one large hospital. This is both for convenience of access and for efficiency in administration. It has been the universal experience, the world over, that in tuberculosis, more efficient work can be done in a small institution than in a large one. It is even probable that a small institution can be more economically administered than a large one, but even if it cannot be, the difference in cost of maintenance would easily be offset by greater efficiency in administration, attainable in small institutions. Large institutions can be economically administered when expensively built and equipped, but not when cheaply built and equipped. They are costly to manage on account of the difficulty of getting competent employes and the heavy cost of repairs and replacements. It is much easier to get people capable of running a small institution than to get people capable of running a large one, and, unless the people who run the institution have executive capacity commensurate with the size of the institution, there is not only loss everywhere, but confusion arises which seriously militates against the results which are sought for as regards both cure and prevention.

In locating a hospital for consumptives, one need not be concerned much about anything except the convenience of access and the cost of real estate. Good work can be done anywhere, if enough brains and heart are put into it. The motto should always be: "The greatest good for the largest number at the smallest outlay of money." With this motto as the guiding principle, the Crusade against Tuberculosis may be conducted economically with the prospect of reaping a rich harvest in the near future. It should be kept close to the people, however, and be conducted by the people for the good of their own.

TREATMENT OF ACNE VULGARIS WITH ACNE-BACILLUS
SUSPENSIONS.*

By MARTIN F. ENGMAN, M. D., of St. Louis.

It is strange that more investigative work has not been done in the study of acne vulgaris. No disease could be more conveniently situated for study, while the material is exceedingly abundant. Textbooks on skin diseases seem in doubt as to the etiology of acne vulgaris, and they still cling to the old ideas appropriated before the days of bacteriological investigation. Most textbooks state that the causes are varied, due to reflex neurosis, some peculiar condition of the stomach, or digestive disturbances; to dust, dirt, constipation, chlorosis, menstrual irregularities, etc. etc. They maintain, however, in passing, that certain pus organisms are found in the lesions and that a bacillus is found in some of the cases. Some of the textbooks attribute certain types to a specific organism.

No doubt there are different types of acne. In other words, certain papular and papulo-pustular lesions occur on the face at certain times of life, and are called in a general way acne; but unless the lesions are associated with comedones, we cannot call the condition acne vulgaris, as the latter is a distinctive disease which can be easily isolated from other papular or pustular conditions of the face.

The true etiology of acne vulgaris is not generally recognized, but it is as distinctively a parasitic disease as syphilis, tuberculosis, or leprosy. If one studies the histological picture presented by acne vulgaris lesions, he will see there a bacillus in as distinct and direct relationship to the formation of the lesion, as the tubercle bacillus is to the lesions found in tuberculosis. There are giant cells containing this small bacillus; the bacilli can be found scattered throughout the skin, particularly round the periphery, where they are often massed in clumps or groups, and seem to be surrounded by a homogenous substance. In the centre of the acne lesion one sees a broken up homogeneous detritus containing no bacilli, if the process is at all advanced. If such a lesion is opened and its contents emptied, it will be found to consist of a gelatinous, sticky mass, in which it is difficult to find bacilli, as they have become disintegrated in the homogeneous substance. However, if an earlier and less advanced lesion be taken and its contents squeezed out or emptied, a little necrotic plug will appear, and smears from it will show numerous bacilli. This plug is the beginning of the formation of the necrotic homogeneous substance in the larger and older lesions. If a very old cystic acne cavity is investigated, one will find that it is filled with this necrotic substance, and

*From the Barnard Free Skin and Cancer Hospital (St. Louis Skin and Cancer Hospital).

that the walls contain a membranous-like structure with numerous bacilli on the periphery. These lesions are very difficult to cure, as the new formation at the periphery protects the micro-organisms, and forms a secreting structure which is as difficult to destroy as the walls of a cyst.

When an acne lesion undergoes involution it leaves a scar. In ages gone by, great stress was placed upon the diet in acne vulgaris, and our leading dermatologists still cling to candies, chocolate drops, pies and pastries as the principal etiological factor. Of course, it is probable that certain elements of the diet may furnish through the products of indigestion, or through the constituents of the food, itself, some element helpful to the growth of this micro-organism. Yet it is the history of those afflicted with this disease that something besides diet is necessary for its cure. All the remedies used for the cure of acne vulgaris produce a local leucocytosis; in other words, they redden the face, bring the blood to the part, and cause reduction of the epidermis and scaling. Probably the most efficacious treatment is that of Lassar's sulphur paste, or Unna's resorcine paste. Most of the efficacious acne remedies contain sulphur in some form, and no remedy used on the skin encourages a local leucocytosis or hyperemia better than sulphur. Therefore, the benefit derived from local treatment is probably due to the local effects of hyperemia and local leucocytosis produced by the remedies on the micro-organism. At the same time a therapist uses a restricted diet together with the remedies which produce a local hyperemia, and in his reasoning he is more apt to place the beneficial result to the effects of the diet than to the local treatment. This has been the history of all parasitic diseases until the parasite was discovered and specific treatment adopted.

Diseases known now to be parasitic were formerly considered as the result of some diathesis, dyscrasia, catching cold, east winds, or some dietary indiscretion that may happen to be the custom of the country in which the disease occurred.

In 1893, while working with Unna, I was first introduced to the study of acne vulgaris by laboratory methods. Professor Unna was preparing at that time material for his wonderful book on the "Pathology of Skin Diseases," and gave me comedones and acne vulgaris as an *Arbeit*. In pursuing this work a very small bacillus was found in the comedones, together with the bottle bacillus and several forms of cocci. In the acne lesions the small bacillus predominated, and from its suggestive location and relationship to the lesion, it was believed by Unna and his laboratory assistants, Monahemd Hodara and myself, to be the cause of the disease. In the bacteriological investigation of these lesions the small bacillus, together with the other organisms, was grown in plate-cultures. Unfortunately, we could not obtain a luxuriant growth of the small bacillus, either upon plate or sub-cultures. On leaving Hamburg all my preparations were turned over to Monahemd Hodara, who continued the work for Professor Unna. Hodara gives a splendid description of these bacilli

in his article,¹ and mentions verbal communications with Unna and myself about these bacilli.

Sabouraud,² in 1894, published his first communication upon his microbacillus of seborrhea, in which article he truly states that Unna, Engman and Hodara did not obtain pure cultures or sub-cultures of this bacillus. In 1899 Gilchrist was appointed by the American Dermatological Association to investigate pus organisms of the skin. During this investigation he discovered a small bacillus in the pus from acne vulgaris lesions. He was successful in cultivating this bacillus, and in carrying on other investigations which confirmed him in the belief that the acne vulgaris lesions were caused by it. Therefore, he named the organism, *Bacillus Acne*.

In 1903 Gilchrist³ presented a very elaborate work upon the etiology of acne vulgaris, in which he again asserted his belief that the bacillus described by him in 1899, and by Unna and Sabouraud, was the cause of the disease. He formed his conclusion from the fact that the bacilli were found in the pus of the acne lesions, not only in smears, but in the cultures; that it was also found in the microscopical section of both the comedones and the nodules of acne; that it was pathogenic to mice and guinea-pigs, and that it was agglutinated by the sera of acne patients.

In 1902 I again began the investigation of acne vulgaris, and succeeded in cultivating the organisms I had formerly found in acne lesions while working with Unna. On account of the delicate cultural characteristics of this organism, I found it exceedingly difficult to work with, and was unfortunate in not being able to continue its growth for a long period on account of not obtaining proper culture media. It was not until 1904 that I was again successful in getting a luxuriant culture, but on account of unfortunate laboratory assistance, my cultures were again lost. In 1908 another lot of favorable media produced vigorous cultures. Wishing to take advantage of this success, I took a number of them to Johns Hopkins Hospital to compare them with the organism described by Gilchrist. While there, both Gilchrist's cultures and my own were submitted to Professor Welch for comparison, and he at once declared that he thought the organisms were identical. He furthermore stated that he believed from the investigations of Gilchrist, myself and others, that the bacillus was specific for acne vulgaris. Gilchrist also thought the organism cultivated by me was identical with the one with which he had been working.

The organism cultivated by me in 1902-4-8, was identical with the one with which we had worked in Unna's laboratory. Whether it is the same organism described by Sabouraud, I am not in a position to state; but as his description of its morphology tallies with the organism with which I am familiar, I believe that the Sabouraud organism is the

¹*Jour. Mal. de Out. et de Syph.*, 1894, Vol. 6, p. 516.

²*Annal. de l'Ins. Pasteur*, 1894, p. 143.

³*Jour. of Cutaneous Diseases*, 1903, p. 107.

same as that described by Unna. The acne bacillus is a very sensitive organism and is difficult to cultivate. In my experiments I have made a certain batch of media and had it to grow luxuriantly. After making up the next batch identical with the former, I have been disgusted to find that the organism would not grow upon it. This has repeatedly been my experience. I have asked several experienced laboratory technicians to assist me in the work; this they have done, but repeatedly they have met with the same results as myself. One batch might produce luxuriant cultures, while the next would produce none at all. I have never succeeded in growing the organism anaërobically. Nutrient agar, neutral in reaction or slightly acid, has proven in my hands to be the best culture-medium. I have had numerous batches to produce luxuriant cultures, but have failed with it oftener than I have succeeded.

In talking with Dr. Gilchrist on this subject, he told me that his experience in cultivating the organism had been similar to my own. I have found the bacillus to be fatal to rabbits and guinea-pigs, and have recovered the organism post-mortem from these animals.

I have failed to agglutinate the bacillus with any dilution of blood from acne patients, but believe that my experience is not sufficient to offer an opinion upon the validity of this test.

It is strange, as I have said before in this article, that more investigative work has not been done with the acne bacillus, especially since vaccine-therapy has come into such general use,—that more reports have not been made upon this subject.

Sabouraud has never claimed that the acne bacillus was the cause of the pustules and nodules of acne. He believes that the lesions of acne vulgaris are due to secondary infection. Gilchrist, I know, has used acne vaccine for some time in the treatment of acne vulgaris, but do not know of any published report by him upon this subject. One of the first and most extensive reports is by Fleming,⁴ who gives a most excellent description of the organism and its characteristics. He believes that the acne bacillus is "frequently" the cause of pustulation, and treats his patients with a mixed vaccine of staphylococci and bacilli. His success was encouraging in some of the cases treated, and he states that marked results obtained in some cases furnish very strong evidence that the bacillus is largely responsible for the suppuration.⁵ In using mixed vaccines he has found that the treatment yielded brilliant results in some, while in others there was no appreciable improvement. Other writers who have reported on this subject have had a similar experience to Walsh and Fleming.

If one investigates any pustular lesion of the skin, no matter what its primary cause, he will find staphylococci a constant factor and almost always present. So it is with acne. In nearly every acne vulgaris lesion,

⁴*The Lancet*, April 10, 1909.

⁵*Medical Press and Circular*, January 26, 1909.

one will find the ever-present staphylococcus. I have cultivated the acne bacillus from many acne lesions when no staphylococci grew upon the culture medium, but this occurrence is extremely infrequent. If one takes the pus from the upper part of the lesion, staphylococci will always be found; but if the more superficial pus is wiped off and the culture taken from the necrotic plug or deeper pus, one will not infrequently obtain a pure culture of the acne bacillus. After obtaining a culture of the acne bacillus it is always necessary either to take the necrotic plug and place it on the culture media, or a small loop of the pus and place it gently *en masse* upon the media. Wiping or smearing the contents of a pustule over culture media will always meet with negative results.

I have never been able to make sub-cultures; therefore, it is a very difficult matter to obtain sufficient luxuriant growths from which to make vaccines in any quantities. It is an impossible amount of detail laboratory work to obtain autogenous acne-bacillus suspensions for each individual case of acne vulgaris. Therefore, in the large majority of instances we must rely upon stock vaccines for each investigation, and it has been my experience in the study and treatment of 208 cases of acne vulgaris that stock vaccines yield as brilliant results, in most instances, as the autogenous.* In May, 1910, I submitted a study of 118 cases of acne vulgaris treated with vaccines. The present report includes 208 cases, 40 of which were treated with staphylococcic suspensions and 168 with acne-bacillus suspensions. In my early study of acne, the staphylococcic vaccines were used almost exclusively, and it was found that some of the cases improved to a certain point to remain at a standstill. I, therefore, having received no further encouragement, abandoned their use, but later I discovered that the staphylococcic suspensions were serviceable in obtaining pure cultures of the acne bacillus, as a few injections of the staphylococcic suspensions seemed to render the acne lesion sterile of these organisms, thereby allowing the acne bacilli to grow without this contamination. Our early work with acne bacilli was discouraging,—so much so, that we almost lost confidence in its apparent and presumptive etiological value. Case after case became worse, after using it in the doses and intervals recommended by Fleming and others. But, after treating a large number of cases, a technique was developed, which, in our hands, has proven very satisfactory. In the last three months, an unusual number of acne cases have come under observation, which have enabled us to thoroughly test this treatment. Old cases, in which our former efforts with all forms of treatment proved unsuccessful, have been called in and have been given vaccines.

In brief, the treatment of acne vulgaris with suspensions of acne bacillus has proven, in our hands, since a proper technique has been adopted, the most brilliant therapeutic agent we have yet seen in dermatology. Some of the cases respond as does the membrane in diphtheria to its antitoxin; nothing else in medicine can compare with its action in

favorable cases. There is only one drawback in these very favorable cases and that is the lesions undergo such complete and rapid involution that deeper and more marked scars supervene. Nothing demonstrates Wright's negative phase better than these suspensions in acne. Invariably two or more new lesions appear within forty-eight hours after an injection. If a large dose is given, a numerous crop can be produced, and the negative phase prolonged for days. By repeated large doses, a mild case can be aggravated or converted into a severe one with large cystic lesions; and, furthermore, the positive phase in such instances is not clinically evident. Such a patient remains for some time extremely sensitive to any dosage. Such has been our experience with those of fifty millions at seven-day-intervals, an experience repeated several times by us. Mild cases stand a larger dose than severe ones; in the latter, continuous small doses give the best result.

From our experiments, the following technique has been developed: the initial dose is never over three millions, and it is not given until two or three days after cultures have been taken, as manipulation of the lesions throws more immunizing bodies on the system, which, together with the vaccines, is too much and may defeat the end. I have often wondered at the prompt appearance of many new lesions after a vigorous massage of an acne skin or after opening many lesions. I have seen several outbreaks of acne follow treatment by a masseur, which I formerly thought due to infection by him, but now believe to be dissemination through local lowered immunity. After a dose of three to five millions, one or two new lesions will appear within forty-eight hours, generally the next day. If more than three appear during the negative phase, the dose is too large. On the third day, seventy-two hours after injection, the comedones are expressed and all lesions opened. The manipulation at this time brings the immunizing blood to the part, since it is at the height of the "tidal wave of immunity." The large cystic lesions are opened by a thin cataract knife and the pus is squeezed out; the walls of the lesion are in this way rubbed together, and by irritating them fresh immunizing lymph is brought into the cavity. Formerly, these large cystic lesions took a long time to heal; often it was necessary to wipe them out with carbolic acid and alcohol before they would cease discharging. This method dries them up within a few days. The patient is also instructed to apply hot towels to the face twice daily for five minutes so as to cause a local hyperemia. On the fifth to the seventh day new lesions will appear, which signify another stage of depression, and are the indication for a second dose of vaccine. Another dose of three to five millions is given; in this way a cure is completed. Small doses, sufficient to cause a short negative phase, seem with us to be the best method. After several doses, new lesions cease to appear. If, after a few doses, new lesions appear after the third day, a larger dose of seven to ten millions should be given, but this is rarely necessary. Small doses at from five

to seven-day-intervals, with methods employed to produce local hyperemia, thereby bringing the immunizing blood to the part, are sufficient to secure immunity in the majority of instances. By this technique all lesions, even the deep, indurated ones, undergo comparatively rapid involution. Cases of acne of years' standing, which have resisted the most approved therapy of some of the most eminent men, have responded kindly to this form of treatment.

A remarkable and gratifying thing is that the thick, muddy, yellowish, oily appearance of the skin disappears. The texture of the skin also improves, and a pinkish tint supervenes. The oily seborrhea of the scalp improves. It seems as if Sabouraud's dicta are true. We know the oily, yellowish-tinted skin precedes the acne lesions for a considerable time.

It has not been found necessary, in any of our cases of acne vulgaris, to use staphylococcus vaccines; at least, not since we have employed the method above outlined. The acne bacillus seems to be the offending agent alone, and, although accompanied by the staphylococcus in nearly every lesion, the lesion is not a result of symbiosis, the coccus being, no doubt, only a secondary factor of no therapeutic importance.

In acne varioliformis, the rôle is changed, turned about completely, the staphylococcus being the main factor, and the acne bacillus, which is frequently associated with it, a secondary unimportant element. Acne vulgaris is essentially a disease of puberty, while acne varioliformis usually occurs after thirty. Our experience is not sufficient to state whether the immunity after the use of these suspensions is permanent or not."

The above is part of my report submitted to the American Dermatological Association last May. Since then I have studied 90 additional cases, making a total of 208 in all, and must say I have no reason to change my opinion as to the value of acne-bacillus suspensions in the treatment of acne vulgaris.

One must not forget, however, in carrying out the technique of this method that one is not using a specific serum, where a definite dose is known, nor crude salves or lotions, but is dealing with the subtle and little known principles of immunity; and that failure in an individual case, or cases, should not necessarily mean the condemnation of the method.

I have seen some of the worst cases of acne disappear in a most wonderful and rapid manner after the injection of a few million of dead bacilli without any local treatment or change in diet whatsoever. Again, I have seen very matured cases of acne seem stubborn and almost unimproved under the same treatment. Yet in every case treated by this method, which I have seen, a cure has ensued when the case has remained long enough to allow a profitable study of the individual dose and interval of dose. The method depends necessarily upon the size of the dose and the interval of the dose.

The general laws above given are, of course, for the majority of cases, but a radical change must be made in the treatment of certain individuals. The following will sometimes happen: After ten or fifteen doses of, say from three to five million bacilli in each dose, at five to seven-day intervals, the patient will return at the next visit with many new lesions. This is, of course, discouraging, both to the patient and physician; yet, when this occurs, if the physician will discontinue the treatment for a couple of weeks, the patient may return with nothing left of the former eruption, and no more lesions may appear. This has been my experience in several instances. My attention was first attracted to this in an individual in whom numerous lesions continued to appear after ten injections had been given. On his last visit I was very much discouraged. He did not re-appear for two weeks, when I was surprised to see that nothing was left of his former eruption but the pigmented sites. Since then he has received no injections, and the face has continued free from all acne lesions.

If there are a certain number of instances, in which the disease has existed for a number of years in a most violent and destructive manner, which are cured by acne-bacilli suspensions, without any other treatment being administered, either local, constitutional or dietary, then we are justified in assuming, in case the results are indifferent, that it is the fault of the technique and not the method. The technique in the administration of these suspensions necessitates a great deal of study, and the method is not by any means complete or satisfactory; yet my results have been so excellent in all the cases in which it has been persisted, and where diligent study has been made, that I am confident in the assumption that acne vulgaris is due to the acne bacillus, and can be cured by Wright's method, when it is properly carried out. Of course, in the study of acne vulgaris in its relation to the acne bacillus, a number of very pertinent questions arise in one's mind, especially when one thinks of the occurrence of acne at the age of puberty; of its exacerbation during the menstrual period; its disappearance during adolescence, etc.; but these can all be answered when one compares this infectious disease with others occurring at certain ages, and when we realize that in all infectious processes the local resistance may be lowered by general disturbances which allow a local exacerbation. I am thoroughly convinced that we must not consider acne as a symptom of gastric or intestinal indigestion, or as a result of "chocolate candy or badly made pies." I have purposely fed some of the worst acne cases that have been cured by acne-bacillus suspension, upon pies, cakes and candy of all kinds during the active part of their treatment, and in spite of these indigestible agents, the acne lesions have gone on to complete involution.

MEDICAL AND SURGICAL PROGRESS.

NEW METHODS OF SKIN STERILIZATION.

A REVIEW OF RECENT LITERATURE.

By ALBERT E. TAUSSIG, M. D.

1. Baum (*Med. Klinik.*, 1910, No. 12).
2. Bogdan (*Zentralbl. f. Chir.*, 1910, No. 3).
3. Brewitt (*Muench. med. Wochenschr.*, 1910, No. 6).
4. Donati (*Deutsch. med. Wochenschr.*, 1910, No. 13).
5. Grossich (*Berl. klin. Wochenschr.*, 1909, No. 43).
6. Grossich (*Zentralbl. f. Chir.*, 1910, No. 21).
7. Hesse (*Zentralbl. f. Chir.*, 1910, No. 15).
8. Karewski (*Klin.-therap.-Wochenschr.*, 1910, No. 13).
9. Knoke (*Muench. med. Wochenschr.*, 1910, No. 18).
10. Kutscher (*Deutsch. med. Wochenschr.*, 1910, No. 22, Abstr.).
11. Loew (*Deutsch. med. Wochenschr.*, 1910, No. 22, Abstr.).
12. Mueller (*Deutsch. med. Wochenschr.*, 1910, No. 34).
13. Nast-Kolb (*Muench. med. Wochenschr.*, 1910, No. 6).
14. Schumburg (*Deutsch. med. Wochenschr.*, 1910, No. 23).
15. Selter (*Deutsch. med. Wochenschr.*, 1910, No. 34).
16. Streitberger (*Deutsch. med. Wochenschr.*, 1910, No. 29).
17. Unger (*Berl. klin. Wochenschr.*, 1910, No. 2).
18. Viannay (*Arch. prov. de chir.*, February 10, 1910).
19. Waterhouse and Fenwick (*Lancet*, April 16, 1910).

In the last few months the German medical journals have contained a large number of contributions on the subject of skin sterilization, both as regards the field of operation and as regards the operator's hands. The older methods, still in general use, are unsatisfactory in several respects. In the first place they represent a considerable expenditure of time and labor. In the second, unless carried out with scrupulous care and exactness, they are inefficient. At their best they hardly ever render the skin truly sterile and often they tend rather to fix the still living bacteria in the skin rather than to remove them. This has been shown, by bacteriological methods, to be especially the case in the use of the brush, soap and hot water. The vigorous scrubbing, usually prescribed, softens both the skin and the envelopes of the bacteria and makes the latter adhere firmly to the former. The subsequent chemical disinfection is far removed from killing all the bacteria in the interstices of the skin; hence the need for rubber gloves. A demand has thus arisen for a simpler and more effective method of skin sterilization, and, if subsequent experience

confirms the results recently obtained, it would appear that this demand has been met.

The Disinfection of the Hands by Means of Alcohol.—The use of alcohol in hand sterilization is not new. The best known methods are those of Fuerbringer and of Ahlfeld. According to the former, the hands are scrubbed with brush, soap and hot water and then disinfected for five minutes in alcohol and two minutes in one to a thousand bichloride. Here the alcohol represents an intermediate step. Ahlfeld brushes the hands five to ten minutes with soap and hot water, dries them, scrubs them three minutes with a brush and absolute alcohol, and then rubs them two or three minutes with alcohol and a flannel cloth.

Both of these methods consume time and do not give perfect results. Schumburg, two years ago, was the first to suggest that soap and hot water might be dispensed with, and the alcohol alone used to sterilize the hands. In a recent communication he sums up the results of his experience with his method in the last few years. As he is the surgeon-general for the Military Department of Strasburg, his material is a large one. His conclusions, based both upon experimental and clinical evidence, are as follows:—

1. Washing and brushing the hands with soap and hot sterile water, even when energetically practised for fifteen to twenty minutes, removes few if any of the bacteria attached to the skin.

2. On the other hand, washing the hands with absolute alcohol almost always renders harmless 99 per cent. or more of the skin-bacteria, a result not surpassed by any other method. For this purpose 200 c.c. of alcohol, which may be applied with a little gauze or cotton, suffice.

3. The same results can be obtained by means of ordinary denatured alcohol.

Schumburg believes that soap softens the skin and the envelopes of the bacteria and makes the bacteria cling so firmly to the skin that even energetic scrubbing fails to remove them. Alcohol, on the other hand, hardens both skin and bacteria, and reduces their adhesion to such an extent, that the bacteria can readily be wiped off. The bactericidal action of alcohol completes the sterilization. The point upon which he lays most stress is that, if the alcohol is to unfold its full power, no water, and therefore no soap, must be used.

As yet, surgeons find it difficult to make up their minds to dispense with soap and water. This hesitation is natural enough, but is not justified by any experimental evidence. Even visibly soiled hands can readily be cleansed with alcohol, though, to be sure, a somewhat larger quantity is then required.

The preliminary washing with soap has the double disadvantage that the water which remains on the skin dilutes the alcohol, thus making it less effective, and that the application, first of water and then of alcohol, causes the skin to become rough and desquamating. Alcohol alone does not produce this effect.

Kutscher, on behalf of the Prussian government, has tested Schumburg's method experimentally. He finds that washing the hands for five minutes with concentrated alcohol, without the previous application of soap or water, produces a degree of sterility that is not increased by the subsequent use of one per thousand bichloride and ten per cent. peroxide. He believes that the alcohol does not act so much by means of its bactericidal power as through its ability to dissolve the fat, cleanse the skin, remove the superficial epidermis, and, above all, to fix the bac-

teria firmly to the skin, much as they are fixed to cover-glasses in bacteriological work. This sterility of the hands persists for an hour or so, even when they are softened by continuous immersion in aqueous fluids.

Loew, also on behalf of the Prussian government, has tested the method clinically. He washes the hands for a minute or less with soap and water and then rubs them for five minutes with 200 c.c. absolute alcohol, using sterile cotton sponges frequently renewed. He has obtained results not inferior to any of the more complicated methods and recommends the procedure, especially for military surgery.

Good results have also been reported from the surgical clinics of Tavel at Bern, and of v. Bruns at Tuebingen. Selters of Bonn, has also tested the method bacteriologically and finds it thoroughly satisfactory. He suggests that, where the transportation of the liquid alcohol is connected with difficulties, as in country practice, it may be replaced by a stiff paste consisting of 86 per cent. absolute alcohol and 14 per cent. soap. This paste may be carried in metal tubes and a small amount rubbed into the hands which have been superficially cleansed with soap and water. The alcohol rapidly evaporates and leaves the soap behind as a brittle solid which may be rinsed off either in sterile water or in dilute bichloride. The results obtained by this method were as good as by any other. It is essential, however, that the paste contain at least 75 per cent. of absolute alcohol and little or no water. The ordinary alcoholic soaps gave him no better results than ordinary soap and water, *i. e.*, the number of skin-bacteria was diminished by about half.

The Disinfection of the Field of Operation by Means of Tincture of Iodine.—The very fact that different operators have advocated a great variety of methods for sterilizing the field of operation is an indication that none of these methods is entirely satisfactory. Most surgeons are still accustomed to scrub the skin of the patient with soap and hot water and then to rub it with alcohol, ether, and bichloride. Not only are these methods laborious and time consuming, but, as Tirelli showed, some six years ago, they are all of them inefficient unless carried out with scrupulous exactness. If carelessly done, the bacteria in the deeper layers of the skin escape destruction and are enabled to infect the wound. Grossich, in 1908, suggested a radically different method which possesses many advantages and is coming into use more and more on the continent of Europe. Having, if necessary, shaved the skin dry, without the use of water, Grossich rubs the site of operation with 10 to 12 per cent. tincture of iodine after the patient has been placed upon the operating table. During the beginning of narcosis, the field of operation is again painted with tincture of iodine, a third application is applied to the line of incision at the close of operation and a dressing of sterile gauze applied. If, for any reason, the dressing is changed before the seventh day, another application of iodine is made. Both bacteriological and clinical tests have shown that this method, in spite of its simplicity, is at least as efficient as any of the older methods, however carefully they may be performed. A large number of surgeons in Germany, France, Italy and elsewhere are using this procedure and express themselves enthusiastically concerning it. It differs from the older methods chiefly in the fact that the alcohol in the tincture enables the iodine to penetrate into the deeper layers of the skin and to destroy the bacteria resident there. Many surgeons are accustomed to supplement the ordinary methods of skin sterilization by means of the subsequent application of tincture of iodine, especially in and about the navel. Under these circumstances, however,

the antiseptic action of the iodine is greatly diminished. The preliminary use of hot water causes a swelling of the superficial cells of the skin, due to the imbibition of water, whereby the penetrative action of the tincture of iodine is greatly diminished. In order to unfold its maximum antiseptic action, the tincture of iodine must be applied to skin that has not recently been washed.

Various surgeons have suggested modification of Grossich's original procedure. Thus Nigrisoli applies the officinal tincture of iodine after the skin has been rendered free from fat by means of benzine, Rolando employs a preliminary scrubbing with denatured alcohol, Bogdan with one per thousand iodine-benzine, Donati substitutes for the officinal tincture a one per cent. solution of iodine in absolute alcohol. It is not clear, however, that any of these procedures represent an improvement over the original method.

The advantages of the method are:—

1. Its great simplicity and rapidity.
2. The uniform healing by first intention, in the ordinary aseptic operations.
3. The possibility of rapidly enlarging the field of operation or of operating in other unprepared regions of the body.
4. The clear visibility of the extent of the area of sterilized skin.
5. The avoidance of vigorous rubbing where the nature of the disease contra-indicates it, as in penetrating wounds of the abdomen, abdominal hemorrhage, perforation peritonitis, acute inflammatory conditions and the like.

Among the disadvantages of the method are:—

1. Irritation and even inflammatory reaction of the skin. This has occasionally been observed, especially in scrofulous patients and is almost certain to occur about the penis, scrotum, perineum or axilla, if two iodized skin surfaces are allowed to remain in contact. If, however, this contact is prevented or if subsequent to the operation, the iodine is removed by means of alcohol or of Heusner's iodine-paraffine-benzine, as suggested by Brewitt, the iodine method may be used even in these localities.

2. The disappearance of various color changes in the skin, the observation of which may occasionally be of service in the conduct of the operation, as in lupus, angiomatica, varices, and the like.

These faults, however, by no means suffice to counterbalance the manifest advantages of the method.

Among the many contributions, in regard to this method of skin sterilization, that have appeared in the last few months, a few may be selected for mention. Donati reports from the surgical clinic of the University of Turin, that in 400 major operations perfect skin sterilization has been attained by the use of an alcoholic solution of iodine. In emergency operations, the tincture of iodine is used without previous washing of the skin. When there is time, the patient is given a bath twenty-four hours before operation; the field of operation is then shaved, dried with sterile gauze, washed with alcohol and painted with the alcoholic solution of iodine. A sterile gauze dressing is then applied, but this is not indispensable. The following day the patient is placed on the operating table and the site of operation treated with alcohol-iodine as described above. In only one of Donati's 400 cases was there suppuration, but this was apparently due to the silk, since the pus appeared deep in the wound after the latter had healed by first intention.

Mueller reports that, in Koenig's clinic at Altona, the Grossich method has entirely replaced the older procedures in skin sterilization. In many hundreds of operations of all sorts it has proven entirely satisfactory. In the ordinary aseptic operations it is at least the equal of the older methods; where the skin is infected it is far superior. Thus when an ileus requires operation in the neighborhood of an opened appendiceal abscess or if the skin over a hernia is eczematous or covered with furuncles, the Grossich method alone gives good results. This is still more strikingly the case in infected or crushed wounds, in compound fractures and the like. Here any washing of the soiled skin, whether with water, bichloride, or alcohol, inevitably carries infectious material into the wound. Painting the surrounding skin with tincture of iodine, however, renders it aseptic without affecting the wound itself. In laparotomies it is well to protect protruding intestines from contact with the iodinated skin by means of compresses, though when this was neglected, Mueller never observed any ill results. A special advantage of the method is the ease with which the field of operation can again be rendered sterile after infection by means of an unexpected movement of the patient or the hands of a careless bystander. Finally Mueller points out the importance of the method for military surgery and other emergency operations in localities where trained assistants and a hospital equipment is not at hand.

Viannay of St. Etienne, expresses himself in similar terms.

Waterhouse and Fenwick use a two per cent. solution of iodine in rectified spirits and report distinctly better results than with the older methods. They emphasize the importance of omitting any preliminary washing with water or with watery solutions of antiseptics. Methylated spirits should not be used as its fumes irritate the conjunctivæ of the operator. A minor defect of the method they find to consist in a hyperemia of the skin and the subcutaneous tissue following the use of iodine. Superficial hemorrhages are therefore somewhat more frequent than is ordinarily the case.

Knoke, the director of the Marine Hospital at Kiel, also expresses himself enthusiastically in regard to the method, which he has used in 350 operations of all sorts. In about one per cent. of his cases an iodine eczema occurred, but this was never very severe, and, to his mind, does not form a reason for abandoning the method.

Streitberger reports that Grossich's method was used in Sick's clinic at Leipzig in 110 hernia operations, 14 hydroceles, 22 early appendectomies, 44 operations in the interval, 12 strumectomies and about 1000 minor operations, with uniformly good results. He believes that a dermatitis can always be avoided if the skin is absolutely dry when the tincture of iodine is employed.

Our own experience with the method is confined to such minor operations as fall to the lot of the internist. In aspirating pleuritic exudates, in evacuating ascites, in hypodermoclysis, in intravenous injections, in aspirating blood from a vein for bacteriological purposes, we have of late been accustomed to use this method and have never seen an infection result. The substitution of the application of a coat or two of tincture of iodine for the more elaborate scrubbing and mopping hitherto used, represents a great saving in time and labor. A number of times we have recently had occasion to make blood-cultures in typhoid fever and other conditions. The skin over the vein was simply painted with iodine and the vein aspirated. In no case did we obtain a contaminated culture. This is pretty good evidence of the bacteriological efficiency of the method.

IMPORTANT CONTRIBUTIONS IN THE ADVANCEMENT OF ANESTHESIA.

A REVIEW OF RECENT LITERATURE.

By W. E. LEIGHTON, M. D., St. Louis, Mo.

1. STUDIEN UEBER DIE NARKOSE.—Overton (*Jena*, 1901).
2. THE THEORY OF NARCOSIS.—Meyer (*Jour. Amer. Med. Assoc.*, 1906, p. 167).
3. THE EFFECT OF ETHER ON CERTAIN PROCESSES OF IMMUNITY.—Graham (*Jour. Amer. Med. Assoc.*, 1910, p. 1044).
4. NITROUS-OXID-OXYGEN ANESTHESIA BY METHOD OF REBREATHING.—Gatch (*Jour. Amer. Med. Assoc.*, 1910, p. 775).
5. EFFECT OF CARBON-DIOXID.—Haldane and Smith (*Jour. Path. and Bact.*, 1903, No. 1, pp. 108, 318).
6. ACAPNIA AND SHOCK.—Yandell Henderson (*Am. Jour. Physiology*, Boston, February, 1910).
7. INTRATRACHEAL INSUFFLATION.—Meltzer and Auer (*Jour. Exper. Med.*, 1909, No. 4).
8. THE FIRST CASE OF THORACOTOMY IN A HUMAN BEING UNDER ANESTHESIA BY INTRATRACHEAL INSUFFLATION.—Lilienthal (*Annals of Surgery*, 1910, LII., p. 30).
9. EINFACHER APPARAT ZUR KUENSTLICHER ATMUNG BEI EROEFFNETEM THORAX.—Katzenstein (*Zent. fuer Chirurgie*, 1908, No. 47).

The advancement of the subject of anesthesia has been rapid within the past few years. Not only has progress been made in the experiments regarding the action of anesthetics on the tissues, but many new methods and appliances have been devised to facilitate and render safe anesthesia.

In 1901 Overton (1) of Jena, established the fact that the action of anesthetics, such as ether, was upon the lipoids of the cells.

Meyer (2) in 1906, working independently, came to the same conclusion. He states: "As a result of these studies we arrive at the following explanation of narcosis: the narcotizing substance enters into a loose physico-chemical combination with the vitally important lipoids of the cells, perhaps with lecithin, and in so doing changes their normal relationship to the other cell constituents through which an inhibition of the entire cell chemism results. It also becomes evident that narcosis immediately disappears as soon as the loose, reversible combination, dependent on the solution tension, breaks up. The establishment of the fact that the effect on the lipoids by narcotics, such as ether and chloroform, is such as to immediately inhibit the vital processes of the cell, shows us that these lipoids are among the constituents essential to the life of the body." This theory becomes the most plausible one to account for the action of anesthetics.

If it is true that anesthetics attack the lipoids, the question arises, is it not possible to restore the cells to a normal condition by the injection into the system of some substance capable of breaking up this chemical action? The answer seems probable from the experiments of Graham (3), who worked on the problem of "the effect of ether on the phenomena of bacteriolysis, agglutination and phagocytosis." He found that ether reduced the phagocytic power of the blood, the reduction lasting from two days to several weeks.

Working on the hypothesis of Overton and Meyer, he conducted experiments to determine whether or not the fat-solvent power of ether is the property by means of which it is capable of inhibiting phagocytosis. Without going into the details of these experiments, "he found that when lecithin was added in small amounts to the blood which had been subjected to the action of ether, a prompt restoration of phagocytosis occurred."

Similar experiments were performed with olive oil, and it was observed that the injection of suitable amounts of the oil into the rectum was followed after three to six hours by a restoration of phagocytic power, while on the contrary, the injection of the same amount of physiologic salt solution had no appreciable effect in shortening the period of phagocytic depression.

Another factor established by Overton was the fact that the effect of anesthetics on the cells was directly proportional to the amount of the anesthetic employed.

This fact needs especial emphasis and any means adopted to lessen the amount of ether or chloroform employed should be carefully considered.

In this line the recent work of Gatch (4) of Baltimore is a timely one. He experimented with the effects of a rebreathing of the expired air when using nitrous oxid and oxygen. The rebreathing feature being based on the work of Haldane and Smith (5) on carbon dioxide, and the classic experiments of Yandell Henderson (6) on shock.

The rebreathing feature, so carefully studied and found so advantageous with nitrous oxid gas and oxygen is practically true with ether, as the author has been able to determine with the use of the Bennett gas ether apparatus.

In the method of administration many new devices have been invented and in this respect it has kept pace with surgical science. The recent advance in thoracic surgery has necessitated a change in the administration of the anesthesia both in positive and negative pressure cabinets, and while these changes have been more or less physical problems, it remained for Meltzer and Auer (7) to show a simple but new way of maintaining anesthesia and preventing pulmonary collapse, which would seem to obviate the more complicated and expensive cabinets.

This method known as intratracheal insufflation consists of passing a tube of sufficient size, so as partially to fill the trachea through the mouth, into the trachea as far as the division of the bronchi. The lungs are prevented from collapsing by means of a bellows which pumps air and ether into the lungs under a pressure of 15-25 mm. of mercury.

The residual air, or what would correspond to expiration, escapes by the side of the tube within the trachea. This apparatus has proven very satisfactory in animal experiments and has been tried with success in man (8).

This method at first glance would appear to be similar to the method of Katzenstein (9) of Berlin, who administered ether through a Trendelenburg tracheotomy canula, at the same time keeping the lungs expanded by means of a bellows attached to a T. tube. A valve in the tube allowed the expirations to escape at the will of the anesthetist.

The method of Meltzer and Auer, however, allows perfect oxygenation of the blood, but absolutely without motion of chest or lung, a decided advantage in thoracic operations.

BONE TRANSPLANTATION.

A REVIEW OF RECENT LITERATURE.

By NATHANIEL ALLISON, M. D.

1. THE HISTOLOGY OF TRANSPLANTED BONE.—A. Læwen (*Archiv. f. klin. Chir.*, 1909).
2. HOW LONG AFTER DEATH OR AMPUTATION CAN BONE BE KEPT FREE FROM BACTERIA, AND BE USED FOR TRANSPLANTATION.—W. Bergmann (*Archiv. f. klin. Chir.*, 1909).
3. GRAFTS OF MUSCLE-TISSUE USED IN FILLING BONE CAVITIES.—Nélaton (*Revue d'Orthopédie*, May 1st, 1910).
4. JOINT TRANSPLANTATION.—Lexer (*Archiv. f. klin. Chir.*, 1909).
5. BONE TRANSPLANTATION.—Cahen (*Muench. med. Woch.*, 1909, No. 35).
6. INTRAHUMAN BONE-GRAFTING AND REIMPLANTATION OF BONE.—MacEwen (*Annals of Surgery*, December, 1909).
7. COLLECTIVE REVIEW ON BONE-TRANSPLANTATION. 1908-1910.—Bucholz (*Amer. Jour. Orth. Surg.*, August, 1910).

The case on which Læwen bases his histological findings was that of an eight-year-old boy who developed a sarcoma at the upper end of the humerus. Here the diseased bone was removed and a portion of a tibia with its periosteum intact was immediately implanted. Seventy-eight days after this operation sarcoma recurred and the arm was amputated at the shoulder joint. Careful microscopical studies of this valuable specimen revealed the following histological facts: There was an active process of new bone formation closely associated with the absorption of the implanted bone. At first the implanted bone is rarefied in the Haversian and Volkmann canals and especially in the lacunæ; this is followed by connective-tissue and blood-vessel invasion and again by osteoblasts and constructive process. The implanted bone is entirely absorbed and new bone is formed from periosteum. Had not the sarcoma recurred in this case in the soft parts, it seems probable that the implanted bone would have been successfully transformed into healthy bone-tissue. Two months after the operation the arm could be raised to a horizontal position and union between the humerus and the transplanted section of the tibia was sufficient to maintain a good position. There was found in all sections after examination an active process toward new bone formation.

Bergmann states positively that the cases in which death is due to some infectious disease are not suitable ones from which to take a portion of bone for transplantation purposes, as bacteria in these cases are found generally disseminated throughout the tissues. There is also great danger in the use of portions of bone from the cadaver, which are removed immediately after death; and caution should be used when employing bone obtained after resections and amputations. It is not advisable to subject patients to unwarranted risk. He gives a table of 20 cases ranging in time from six to fifty-four hours, the average being eighteen hours after

removal of the bone; and he finds that the bone was, as a rule, sterile. He concludes that there is danger of infection in accordance with the time after death and the cause of death, and that it is impossible to state whether or not the risk is justifiable.

Nélaton has filled a cavity caused by osteomyelitis, in two cases, with muscle-tissue. In one instance the bone involved was the clavicle. Here a portion of the pectoralis major was put into the cavity; in the other instance, muscle-tissue from the calf of the left leg was put into a cavity in the lower third of the right tibia, both legs being secured in plaster and the muscle-tissue being attached to a pedicle which was cut off on the fifteenth day. Both these cases were followed by good results and he maintains that this is an easier and more certain method than others employed to fill bone cavities.

Lexer has reported successes following the transplantation of a healthy joint from an extremity lost after trauma, into the place left after the excision of a diseased joint. The new joint should accurately fit its bed; therefore, transverse bone division above and below is advisable. He advises against the use of nails, wires, and pegs to hold these joints in place, but recommends the use of skewers made of fresh bone.

MacEwen reports a very successful re-establishment of a humerus by the introduction of a crushed bone-fragments into the periosteal tube, left after the removal of a large portion of the shaft of the humerus. This case was kept constantly under observation for a number of years and numerous operations were done; the final result, however, was an exceptionally good one.

Bucholz in a collective abstract of the last two year's work of bone-transference gives an admirable summation of what has been accomplished in this field of surgery. After giving a review of the histology of bone-regeneration following a transplantation, the author gives the indications as follows: Transplantation of bone is indicated for filling defects due to osteomyelitis, sequestration, and excision of tumors; not only parts of the diaphysis, but also the epiphysis may be substituted with good results. The treatment of pseudarthrosis is much improved by implantation of living bone-producing material to the freshened surface. Attention might be called to a method in the treatment of severe persistent flat-feet. Here Reiner has corrected the deformity as completely as possible and has bridged the longitudinal arch by a piece of bone covered with periosteum which he attaches to the os calcis and first metatarsal. He has obtained very satisfactory results with this operation which he calls osteodesis. As a method this is valuable, perhaps, in the treatment of severe forms of flat-feet, but is certainly valuable as a contribution to the surgery of bone-transplantation. As to the sources from which material is to be taken the views of Bergmann as expressed above are important. All authors agree that living bone taken from the same individual and covered with periosteum is by far the best material for transplantation; next to this comes the use of pieces of bone taken from limbs directly after amputation. The clinical points regarding the healing of these transplantations that need mention are, that it is important to operate with the most delicate asepsis, as any serious infection will interfere with the healing, while a mild infection may lead to partial sequestration. The most striking results have been obtained in this kind of surgery; those of Lexer are especially worthy of comment, for he has not only transplanted great parts of bone, but in two cases has transferred a whole knee-joint and has obtained good results.

TESTS FOR RENAL FUNCTION.

A REVIEW OF RECENT LITERATURE.

By JOHN R. CAULK, M. D.

1. METHYLENE-BLUE TEST.—Achard and Castaigne (*Bull. et mém. soc. méd. des Hôpitaux de Paris*, April, 1897).
2. CRYOSCOPY.—Koryani (*Zeitschr. f. klin. Med.*, Vol. 23, 1897).
3. ROSANALINE.—Dreyfus (*Thèse de Lyon*, 1898).
4. INDIGO-CARMINE.—Vœlcker and Joseph (*Muench. med. Wochenschr.*, p. 2081, 1903).
5. ELECTRICAL CONDUCTIVITY.—Dawson Turner (*Edinburgh Med. Jour.*, April, 1907).
6. PHILORIDZIN.—Achard and Delamare (*Bull. et mém. soc. méd. des Hôpitaux de Paris*, April, 1899).
7. POLYURIA TEST.—Albarran (*Annales des mal. des org. gen. urin.*, 1904); Keyes, Jr. (*Annals of Surgery*, March, 1910).
8. PHENOLSULPHONEPHTHALEIN.—Rowntree and Geraghty (*Jour. of Pharmacology and Experimental Therapeutics*, July, 1910).

The ordinary tests for determining the functional activity of the kidneys, which have been in use for some years, are more or less familiar to all. They will be considered but briefly and our attention will concentrate around the more recent and less familiar ones.

Probably the first observations of the alterations in kidney secretion in disease were made by Hahn, who noticed the absence of the odor of violets in gouty patients after the injection of turpentine, and by Rayer, who noticed the absence of the peculiar odor of the urine in patients who were suffering from nephritis after they had eaten asparagus.

Following this, the elimination of various drugs was studied, among them being the iodides, mercury, Dover's powder, etc.; but very little was accomplished until 1897, when Achard and Castaigne introduced methylene-blue. For some time the test was used quite frequently, but in recent years it has been discarded, as it possesses so many disadvantages. The dye is altered in the system and excreted as a chromogen, only 50 per cent. being normally excreted in the urine. It is slow in appearing and extremely slow to disappear, requiring in some instances several days for its total elimination; and it is greatly influenced by the color of the urine and is not well adapted to colorimetric methods.

Indigo-carmin, first used by Vœlcker and Joseph for testing renal function, possesses the same disadvantages as methylene-blue, and is quite unreliable, only 25 per cent. being excreted by the urine.

Rosanaline, first introduced by Dreyfus, has never enjoyed any grade of popularity. It also possesses the disadvantages of the above described, except that from 60 to 95 per cent. is excreted by the urine. The above drugs have never been of any value in acute or chronic parenchymatous nephritis; in chronic interstitial nephritis, however, they have shown a delay in their time of appearance and the time of total elimination has been prolonged.

In 1897 Koryani introduced cryoscopy as a method of testing renal function. This method is very accurate for determining the solid excretion, but it entails complex procedures, and is so influenced by diet, water, etc., that no assistance can be gained from the study of the urine alone.

The electrical conductivity of the urine, first used by Dawson Turner, has never been in general use, as it is a very complicated procedure, and the instruments necessary for its application are so expensive that it is far beyond the grasp of the ordinary physician. It deals with the mineral content of the urine and is naturally influenced by water and diet.

The test which has been of most value in determining the functional capacity of the kidneys is the phloridzin test. The property of phloridzin in producing a glycosuria without hyperglycemia was first discovered by von Mering, and put into practical application by Klemperer in 1896. The latter found an absence or marked diminution of the glycosuria in various renal disorders. The test has been the most useful one and the most satisfactory, but of late has fallen into disfavor among many, owing to the unreliable results it has furnished. Keyes, Jr., reports several cases where it has been totally misleading, and says that the factors which are credited to its favor may be theoretical but do not appear in actual practice. Walker reports cases where no glycosuria occurred when the drug was injected into patients with perfectly normal kidneys. The test is very sensitive and often furnishes an exaggerated idea of the extent of the lesion.

The polyuria test introduced by Albarran in 1904, and reported later by Keyes, Jr., in 1910, has been quite a valuable test, as it has shown what the others have not—a reserve force of the kidneys. It established the fact that the function of a diseased kidney is more uniform than that of a healthy one and varies less from one moment to another the more extensively the parenchyma is destroyed; that when additional work is forced upon the kidneys the response is more marked upon the healthy than on the diseased side. The test is, however, not always satisfactory, as it is often not possible to produce a polyuria, even after the ingestion of large quantities of water; as it is often difficult to get patients to drink the necessary amount of water; as the polyuria may be present on the diseased side before the application of the test; and finally, the length of time for its completion is too long.

The purpose of this abstract is not only to bring more generally before the profession a test which, though recently published, has already proved of value to those who have used it, but to advocate its trial by all who are interested in the functional activity of the kidneys.

The Phenolsulphonephthalein test of Rowntree and Geraghty is a most wonderful stride in this field of work. It is characterized by its simplicity, accuracy, and by the fact that it has demonstrated impairment of the renal function when all other tests have failed.

Phenolsulphonephthalein was first prepared by Ira Remsen. Its pharmacology has been studied by Abel and Rowntree, and in their work they have shown that it is absolutely non-irritating and non-toxic. The technique of the test is as follows: Twenty minutes before its administration the patient is instructed to drink 300 to 400 c.c. of water in order to insure free urinary secretion. In cases where the total renal function is desired, as in prostatic hypertrophy, a catheter is introduced into the bladder and the bladder thoroughly emptied. 1 c.c. of the solution, containing 6 mg., is administered subcutaneously by means of an ac-

curately graduated syringe. The urine is allowed to drain in a test-tube in which has been placed a drop of a 25 per cent. NaOH solution, and the time of the appearance of the first pinkish tinge is noted. In patients without prostatic obstruction, the catheter may be removed after the drug has appeared, and then the patient is instructed to void at the end of the first and second hour; but greater accuracy is insured if the catheter is left in place during the whole time. The color displayed in an acid urine is yellow, but this immediately gives place to a brilliant purple by the addition of an alkali. The solutions collected during each hour are placed in litre flasks, and distilled water is then added to make one litre. The solution is thoroughly mixed and filtered and ready for comparison to the standard solution which consists of 3 mg. of phenolsulphonephthalein, or one-half of the solution used for injection, diluted up to a litre and made alkaline by a few drops of 25 per cent. NaOH. The standard solution is arbitrarily chosen because of the beautiful pink color which is obtained when the indicator of the colorimeter stands at 10. Then each hour's collection is compared to the standard by the colorimeter. For example: If the left side reads 20, standard on the right side being 10, it takes a column of fluid twice as long to give the same intensity of color as that of the standard, showing that the solution contains only one-half

as much dye, the percentage being $\frac{10 \times 100}{20} = 50$ per cent.; but twice as much

of the drug was administered as was placed in the standard solution, so the percentage would be one-half of 50, or 25 per cent. This drug is particularly suitable for colorimetric methods; Rowntree and Geraghty have shown that they can detect the difference of 0.04 mg. of phenolsulphonephthalein by this method. They have shown that the test is not influenced by the coloring matter of the urine nor by blood, unless present in large amounts. If the function of one or the other kidney is desired, the test is the same except that it is done after ureter catheterization.

The result obtained in normal cases is as follows: A 6 mg. dose was injected; average time of appearance 5 to 11 minutes; 40 to 60 per cent. of the drug excreted in the first hour; 20 to 25 per cent. in the second hour, making from 60 to 85 per cent. in the two hours. The excretion of the drug does not run parallel to the excretion of water. It is immaterial as far as the excretion of the drug is concerned whether the urinary output is 50 or 500 c.c.

The application of the test in various forms of nephritis has given the following results: In the cases of acute nephritis there has been no increase in the permeability of the kidney, but a large percentage of cases have shown a decrease in the amount of total elimination.

In chronic parenchymatous nephritis there has been a marked decrease in the amount excreted. There was also a constant low output in cases of chronic interstitial nephritis. In cases of urinary obstruction, almost all being patients with prostatic hypertrophy, the dye has been a great aid in determining the condition of the kidneys, for we know it is frequently difficult to size up a patient's general condition in many of these cases. Patients with pyelonephritis, pyonephrosis, and pressure atrophy may show a practically normal urea and solid output and yet be on the verge of renal failure. The phenolsulphonephthalein test has been of great service in these cases and has revealed lesions that other tests had not brought out. The greatest impairment of function has been shown in the cases having a large residual urine and not leading a catheter life. It

has been known for a long time that these are the cases in which it is dangerous to undertake an immediate operation. In many of the cases reported by Rowntree and Geraghty, if the output of the drug was low when the patient was first seen, under appropriate treatment a decided improvement in the renal function has been indicated by this test. One of their rules is that, if the time of appearance is beyond twenty-five minutes and the output of the drug below 20 per cent. during the first hour, the operation is postponed regardless of the patient's clinical condition. If, under treatment, the output remains low but constant, the renal function is evidently in a stable condition and the operation may be undertaken. If the residual urine is high, and the patient has not been leading a catheter life, and even if the output of the drug at a single determination is large, operation is deferred in order to determine if the functional activity is stable. In no case where the functional test indicated stable renal function, prior to operation, has there been evidence of insufficiency subsequently. They tried phloridzin in a number of these cases, but it did not prove reliable. They conclude:

(1) That functional tests considered in conjunction with a careful clinical study of the patient undoubtedly furnish information of decided value regarding the functional capacity of the kidney.

(2) The phenolsulphonephthalein test, as they have demonstrated, possesses many advantages over all other functional tests.

(3) It is better adapted for use as a functional test than any other drug thus far proposed, on account of its early appearance in the urine, the rapidity and completeness of elimination by the kidneys.

(4) The method of quantitative estimation of the amount of drug excreted is simple and accurate.

(5) The permeability of the kidney to this drug is decreased in both chronic parenchymatous and chronic interstitial nephritis.

(6) It has proved of great practical value in revealing the true renal condition in cases with prostatic obstruction. It is of more value than the urinary output, total solids, urea, or total nitrogen, and enables the surgeon to select a time for operation when the kidneys are in good functional condition.

(7) The improvement in cases of prostatic obstruction following the institution of preliminary treatment is strikingly demonstrated by this test, and the time most suitable for operation is indicated.

(8) In unilateral and bilateral kidney disease the absolute amount of work done by each kidney, as well as the relative proportion, can be determined when the urines are obtained separately.

DIAGNOSTIC AND THERAPEUTIC NOTES.

COLD ABSCESSSES.—Calve and Gauvain (*Lancet*, March 5, 1910). Our views about the most rational therapy of cold abscesses have, in the course of time, undergone great alterations. In the preantiseptic period many surgeons feared to interfere at all because of the danger of secondary infection. Later, on the basis of the so-called tuberculum therapy, radical extirpation was the rule. The dangers, however, were great and the orthopedic results poor. More recently, surgeons in Germany, England and America operate more conservatively, contenting themselves with curettement of the abscesses and closure of the wound, in the hope of obtaining primary union. The immediate results are good, but usually the abscess fills up again, and often the wound becomes infected and a sinus results. The patient is then in an exceedingly unfortunate situation. In France, therefore, this method has been replaced by purely conservative treatment. The patients are sent to the country or to the seashore, vigorously nourished, and the affected portion of the body put at rest for a considerable period. This, sometimes, alone effects a cure; more often, however, it is necessary to aspirate the pus and to inject modifying fluids. The site of puncture should be as high as possible; if a dependent portion is chosen, a fistula may result. In withdrawing the trocar, the aspiration should slowly be continued. The vacuum so produced prevents pus exuding from the needle and eliminates the danger of infecting the site of puncture. Several successive aspirations are usually needed to bring about obliteration of the cavity. In unfavorable cases this does not take place and an iodoform emulsion must be injected. That used by the authors consists of iodoform 5.0, ether 10.0, guaiacol and creosote each 2.0, sterile olive oil 100.0. Immediately after injection the heat of the body volatilizes the ether and deposits the iodoform, as a fine dust, upon the walls of the cavity. Toxic manifestations rarely result after the injection of 10-20 c.c. of this fluid, except in cases of iodoform idiosyncrasy.

The results reported by the authors are very favorable: 95-98 per cent. of all cases were cured. In only 2-5 per cent. did fistula result. These almost always healed sooner or later, as a secondary infection could readily be avoided.

THE TREATMENT OF HYPERHYDROSIS.—Gerson (*Mediz. Klinik.*, No. 34). Excessive sweating of the feet or of the other portions of the body is best treated, according to Gerson, by wringing out the stocking or other portions of the underwear in a mixture of one part of formalin (40 per cent.) and four parts of alcohol. The underclothing does not suffer and the skin seems to tolerate this method of applying formaldehyde better than the usual local applications with a brush.

THE DIAGNOSIS OF DUODENAL ULCER.—Quenzburg (*Deutsch. med. Wochenschr.*, 1910, No. 28). Patients with duodenal ulcer present a

typical history. They complain of pain, which sets in two or three hours after meals and is relieved by eating. These pains are also apt to occur about one or two o'clock at night. The periods of pain may last days or months, resist treatment, often vanish spontaneously only to reappear. With such a history, the presence of a duodenal ulcer may be inferred with certainty, if the stool contains blood, either once in quantity or repeatedly in traces, or if the stomach shows a disturbance of motility in that a Leube test-meal has not completely passed the pylorus seven hours after its ingestion. Occasionally the dilatation of the duodenum causes the appearance of an area of tympany in the region of the lobus quadratus of the liver. The treatment of duodenal ulcer, once diagnosed, should always be surgical.

A NEW TEST FOR IRITIS.—Salus (*Deutsch. med. Wochenschr.*, 1910, No. 27). Hamburger has recently introduced a new method of applying the fluorescein test, hitherto only used in animals, to man. Eight grams of uranin, otherwise known as fluorescein, are administered by the mouth. In this dose, the stain produces no ill effects of any sort and is well borne by the stomach. The fluid in the anterior chamber of the normal eye is unaffected, but takes on a green tint in the presence of inflammation involving the iris or the ciliary body. The coloration appears very soon after the ingestion of the stain and is absolutely specific for iritis and inflammation of the ciliary body.

PERISTALTIN, A CASCARA PREPARATION FOR HYPODERMIC USE.—Walther (*Munch. med. Wochenschr.*, 1910, No. 34). A pharmaceutical firm in Basle, Switzerland, has placed upon the market a preparation of cascara sagrada, under the name of peristaltin, that can be administered hypodermically. Walther has used it in his clinic with good success. The subcutaneous injection is nearly painless and is followed in three-fourths of the cases by a plentiful and painless evacuation of the bowels. Watery diarrheas never occurred.

ALOPECIA AND SEBORRHEA.—White (*Jl. Am. Med. Assoc.*, September 24, 1910), states that the possible and principal causal factors of alopecia are heredity in 30 per cent., dandruff in 79 per cent., systemic depression in 20 per cent., fever in 11 per cent., and maltreatment of the scalp in 50 per cent. The author reports that the drugs most successful in the treatment of dandruff and loss of hair are eusol, bichloride of mercury, tannic acid and chloral hydrate. While the final results of treatment are unsatisfactory, temporary improvement is noted in 48 per cent. of men and 56 per cent. of women.

VENESECTION.—Burwinkel (*Med. Klinik.*, 1910, No. 19). The writer considers venesection "an indispensable aid in the practice of medicine." He advocates this measure not only in cases of dilated right heart, pneumonia, uremia and eclampsia, but also in acute articular rheumatism, migraine, epilepsy, chlorosis, gout and furunculosis. He goes so far as to see in repeated venesections a prophylactic measure to prevent arteriosclerosis and premature senility. Even in children venesection

is permissible; 10 c.c. may be withdrawn for each year of the child's age.

Even though we may not be inclined to go as far as the writer in our enthusiasm for venesection, there can be no doubt that recent work in pathologic-physiology has established the value of this procedure in a variety of affections. It has been clearly shown, for instance, that in the various aplastic anemias, especially, in chlorosis, repeated small blood-lettings are one of the most certain and efficient methods for stimulating the activity of the blood-producing tissues. It looks as though we were about to see a general revival of this old-fashioned therapeutic measure, if in a degree somewhat less heroic than was formerly customary.

A NEW SIMPLE STAIN FOR TUBERCLE BACILLI.—Kronberger (*Beitr. z. Klin. d. Tuberk.*, Vol. 16, No. 2). The spreads are dried and carefully fixed in the flame. Stain with carbol-fuchsin in the usual fashion, decolorize in 15 per cent. nitric acid, rinse in 60 per cent. alcohol, pour over for a few seconds some tincture of iodine diluted with four times its bulk of 60 per cent. alcohol, wash with water and mount. This carbol-fuchsin-iodine method stains only the pathogenic acid-fast bacilli (not the smegma bacilli) and brings out their structure particularly well.

THE DIAGNOSIS OF DUODENAL ULCER.—Mendel (*Deutsch. med. Wochenschr.*, 1910, No. 37). Unless we accept the view of Moynihan, according to whom every case of "hunger pain" is one of duodenal ulcer, the differentiation between this disease and ordinary hyperacidity is often difficult. Duodenal ulcer may exist in the absence of tenderness on palpation, vomiting, gastric stagnation, and occult blood in stool or stomach contents. Mendel has discovered another sign which he has found very useful. If we percuss the epigastrium directly, best with a hammer, a small area of tenderness will be found,—usually not larger than a fifty cent piece and rigidly circumscribed,—over which direct percussion elicits pain. This will be observed in both gastric and duodenal ulcers, even when palpation reveals no tenderness. The extent of this area and its location will correspond to the size and the site of the ulcer. In duodenal ulcer, the area of tenderness on direct percussion will lie just to the right of the linea alba, a little nearer to the navel than to the costal margin. As the ulcer heals, the area of tenderness can be observed to decrease in extent. In one case of duodenal ulcer, recently observed by us, this sign could not be elicited.

Therapeutically, Mendel favors rest in bed and diet rather than operation.

THE LOCAL USE OF POWDERED SILVER NITRATE.—Baruch (*Muench. med. Wochenschr.*, 1910, No. 35). Kaolin is heated to 100°-150° C., which renders it not only sterile but finer and more hygroscopic. To it is added 1 per cent. powdered silver nitrate. The mixture forms, according to Baruch, an ideal dressing for suppurating and gangrenous wounds. The odor ceases, the granulations become firm and the growth of epithelium is stimulated. In the surgical clinic of the Berlin University, this powder has proven itself superior to all others for dirty and foul-smelling wounds. Its cheapness and its lack of odor are additional merits.

OBITER DICTA FROM FOREIGN JOURNALS.

CREDULITY AND SCEPTICISM IN THERAPEUTICS.

"Physicians," said Professor Hutinel in a lecture recently delivered to the students of the Faculty of Medicine, and reprinted in the *Gazette des Hôpitaux*, "while they bear a family resemblance to each other have certain points which make them dissimilar. Some are grounded in their studies; others are but superficially educated. Some are enamored of their profession; others are content to do their work mechanically and for what it yields them. But there are two types which you will encounter beyond a doubt: those who do not believe in medicine despite the fact that they make a living by it, and those who believe in it too much."

In medicine as in religion there are believers and sceptics. At first sight they appear to be leagues apart, but in reality they are closely related and it is with difficulty that they can be differentiated from each other. If we examine at close range those physicians who believe everything implicitly without ascertaining whether their convictions rest on a solid basis, and those who pride themselves upon discrediting every new therapeutic agent, one will not fail to find that the minds of both are but slightly different. Strenuously to deny is to place too much faith in one's own opinions, and therefore to believe in the wrong way.

Medicine is not an article of faith; it is a science of observation. There is no doubt that only too often it is imperfect and has the further disadvantage of not being exact. How could medicine be anything else than what it is? Are not the arguments, which have always been advanced in support of all medical theories, entirely dependent on the senses, and on what other substratum but the senses can the medical mind build its superstructure of reasoning? And since the senses are not infallible can the ideas be other than faulty? But one point must be conceded to medicine, and that is, that the close study of a patient and an interest in laboratory experiments furnish a judicious physician with enough solid material upon which to rear his reasoning powers.

Unfortunately only too often the imagination of the physician more or less affects the worthiness of the deductions which emanate from the laboratories in the way of pathological facts; and the result is that the physician's conception of a disease and the treatment thereof are not the outcome of a series of pathological phenomena, but rather his own interpretation with the imaginative factor not entirely suppressed.

Face to face with disease the physician is never a savant, much as he is given to praise himself on this score; he is an artist more or less imbued with general ideas. To each case he applies the knowledge which was acquired by others on account of analogous cases; and in accordance with his own intelligence and temperament, he adapts it to the disease in hand. The personal note is never dominant, though it must be admitted it is never entirely absent.

Because of this it is seldom that two physicians have identically the same opinions about the same disease. But even where they have some-

what agreed on the diagnosis, the treatment given by each will be such that it would require one of great perspicacity to detect any resemblance.

Now let us consider what the results of this difference in opinion, as regards treatment, evenuate in. The one, whose expectations were not high, is easily satisfied and shows enthusiasm at once; the other, not readily pleased, is barely convinced that the results are good. Both are in the wrong, and amid these exaggerations how are we to arrive at the truth? Fortunately, between excessive faith and exaggerated scepticism is a middle course, which should be followed by the physician if he wishes to do something that shall redound to therapeutics. But to get at the middle course, to be sane enough to steer towards the truth, is assuredly never an easy task; and especially in medicine is it fraught with great difficulty, since styles change in this special province with about the same frequency that they do in regard to hats. Emetics, blood-letting, purgatives, alcohol, etc., have in turn been vaunted and degraded. It happens only too often that after a drug or a special treatment has been abused by an excess that passes the dreams of sanity, maledictions are hurled at it; but frequently the denunciations are no wiser than the foolish abuse to which the drug or treatment was subjected through lack of judgment on the part of the attending physician.

Medical opinions resemble the movements of a pendulum, in that they oscillate from one side to the other without ever pausing long enough at one point to convey the idea that certainty has been so well established that there need be no fear of a change of opinion, at least, for some years.

Now, if this exaggerated credulity and this dyed-in-the-wool scepticism were innocent of harm it would be right and proper to treat them with a certain degree of levity, but unfortunately these mental attitudes are not harmless. Who has not seen the physician do more harm than good by interfering too much, or the physician who stops treatment too suddenly because his purblindness will not allow him to recognize any results? How much faith ought one to have in the efficacy of drugs, and ought this faith to persist in the face of a number of failures? Who is in a position to answer these vital questions intelligently? But so long as we cannot suppress the matter of temperament, the physician will be held in its meshes, and, according as it exercises its sway for good or for evil, will he be the virile figure in the sickroom, or the vacillating obstructionist who cannot arrive at a decision that might be of the greatest benefit to his patient.

BOOK REVIEWS

MANUEL DES MALADIES DU FOIE ET DE VOIES BILIAIRES, SOUS LA DIRECTION DE G. M. Debove, Professeur de clinique médical, etc.; Ch. Achard, Professeur à la Faculté de Médecine, etc.; et J. Castaigne, Professeur agrégé à la Faculté de Médecine. Par J. Castaigne et M. Chiray. 1 vol. in 8vo., de 880 pages, avec 300 figures dans le texte. Paris: Masson et Cie. 1910. Price, 20 fr.

The great amount of new work that has appeared within recent years, especially in France, in the field of hepatic disease, has made an encyclopedic textbook such as that of Castaigne and Chiray a necessity for those who wish to keep abreast of the times in this branch of internal medicine. No other organ of the body, except perhaps the central nervous system, presents when diseased such a complexity of manifestations as the liver, and in the diseases of no other organ, excepting possibly the heart, is the presentation of the subject in the ordinary textbook so inadequate. With exhaustive completeness and typical French clearness of presentation, the authors have written a book which at present stands alone in the field of hepatic disease. No careful internist, who commands the French language, can afford to dispense with it.

A complete presentation of so large a subject does not admit of a detailed review. Suffice it to say that the book falls readily into two parts: the first, devoted to the anatomy and physiology of the liver and biliary passages, always with an eye to their pathological significance; the second, to a description of the various diseases of this organ, systematically presented. Were it not for a concomitant great increase in the bulk of the book, a variety of illustrative clinical histories, which are almost entirely lacking, would have added greatly to its value. Another, less pardonable fault, is the omission of an index, which is very imperfectly replaced by a detailed table of contents.

HYPNOTISM AND TREATMENT BY SUGGESTION. By J. Milne Bramwell, M. B., C. M., 12mo. cloth, 216 pages. New York and London: Funk and Wagnalls. Price, \$1.75.

This is a smaller treatise of Bramwell's hypnotism and contains in a compact form a description of his methods and an account of his results. The reader of this book can obtain a very fair presentation of the status of hypnotism from one who is expert in its use and who has had unusual opportunities to see and examine patients who have been so treated. For the well-informed neurologist, however, the book is altogether too argumentative and apparently is too much of a plea for the use of hypnotism. No one at present doubts that hypnotism and hypnotic suggestion are facts, but what is still a moot question is whether the use of hypnotism is justifiable as a form of psycho-therapeutics. The author certainly does not settle this question—his clinical data are too vague and his results in treatment are too uniformly successful. There are some seventy-five cases described, but as case reports they are utterly valueless. Outside the clinical part of this book there is contained in it much of value and one can obtain in a clear and most readable form all that is necessary as to hypnotism. For this reason the book is certainly worth reading, but as a contribution to the therapeutic value of hypnotism, if such is the writer's aim, it has but little value.

DISEASES OF THE HEART AND AORTA. By Arthur Douglass Hirschfelder, M. D. With an introductory note by Lewellys F. Barker, M. D., LL.D. Illustrated. Philadelphia and London: J. B. Lippincott Company.

Only two textbooks on diseases of the heart, worthy the name, have appeared in the last two years, that of Mackenzie and this of Hirschfelder. The former is the work of a genius and a pioneer in the field, a stimulating book

but an odd mixture of baseless speculation and keen observation. Hirschfelder's book, on the other hand, while less original is far more useful for the scientific practitioner. Based not only on an extensive personal experience, but also on an intimate acquaintance with the literature of the subject, it alone of all recent books presents the reader with a complete and critical account of our present knowledge in this difficult and complex field. The reader will find in it not only a comprehensive account of the newer methods of cardiac diagnosis with sphygmomanometer, sphygmograph, electrocardiograph, radiograph and the like, but an adequate presentation, as well of the older methods, which, in spite of recent advances in technique, still remain our most valuable aids in cardiac diagnosis.

DISEASES OF THE MOUTH, NOSE, THROAT AND LARYNX. By Alfred Bruck, M. D. (Berlin.) Translation supervised and edited by F. W. Forbes Ross, M. D., F. R. C. S. (England), assisted by Frederick Gans, M. D. Illustrated by 217 figures and diagrams in the text, many of which are in colors. New York: Rebman & Co.

This book by Dr. Bruck is ably written; above all it is well translated. This is not always the case in works produced under similar conditions. The book, in addition to the usual divisions dealing with affections of the nose, throat and larynx, devotes some seventy pages to diseases of the mouth. This we regard as a most valuable addition and one which to our knowledge occurs in no work dealing with these specialties. From its anatomical situation, and the necessary familiarity of the specialist with its diseases, the mouth should certainly belong to the domain of the nose and throat specialist.

We can heartily recommend the book for its clearness of diction, preciseness and brevity of statement, as well as for its special attention to pathology and differential diagnosis. In a work of so comprehensive a nature, something must be sacrificed if the subject-matter is to be condensed within some six hundred pages. This briefness of description is especially noticeable in the detailing of operative technique. Of this, the mere paragraphs dealing with submucous resection of the nasal septum and extirpation of the tonsils may serve as examples. This, however, is a minor criticism in a work of such uniform excellence. But the average physician seems to demand a *multum in parvo*. For this reason we fear that the work may not have the circulation it deserves, inasmuch as the usual division on diseases of the ear is not included.

PSYCHE—A CONCISE AND EASILY COMPREHENSIBLE TREATISE ON THE ELEMENTS OF PSYCHIATRY AND PSYCHOLOGY FOR STUDENTS OF MEDICINE AND LAW. By Dr. Max Talmeij, New York: The Medico-Legal Publishing Company. 1910. Price, \$2.50.

The sub-title of this book—A Concise and Easily Comprehensible Treatise on the Elements of Psychiatry and Psychology for Students of Medicine and Law—is its best characterization. The hearty sympathy of the reviewer is extended to any student of law or medicine in whose hands this book may fall, or who is led by the lure of its preface to read further on. He will soon discover that neither psychiatry nor psychology is a simple thing, nor easy of understanding. If he will stop as soon as this conclusion is forced upon him, and get a better book with a more earnest and scholarly instinct behind it, he may in time get some notion of the subject. Perhaps the chief merit of this book is that it may discourage most of its readers from pursuing the study of psychiatry and psychology and lead others to seek out a better and clearer presentation of the subject. The book itself is not worthy of serious consideration. Its title, "Psyche," would be enough to condemn it, and its bad printing and careless proof-reading help its futility along.

THE SOURCES AND MODES OF INFECTION. By Chas. V. Chopin, M. D., Sc. D. Superintendent of Health, Providence, R. I. Author of "Municipal Sanitation in the United States." First edition. New York: John Wiley & Sons. 1910.

In the reading of this book we were agreeably surprised to find so vast an amount of practical knowledge condensed in so small a volume. There are few subjects more important to the general reader of medicine than the study

of the transmission of disease. In most works we find a cursory treatment of this all-important subject, and frequently the ideas and theories expressed are too antiquated to deserve recognition. In this work, we find the subject-matter treated in a most admirable and successful manner. In the course of the work is shown the exaggerated importance that has hitherto been paid to the growth of bacteria outside the body in relation to the causation of disease. The various methods of infection are individually considered and their relative value is carefully determined. The importance of carriers is discussed in detail and receives the appreciation that is due to this subject, which has been so underestimated in the past. As the author himself acknowledges, certain tenets that he proposes may seem radical; and, indeed, in the light of other matter that we have read on the same subject, they appear to be almost ultra-modern. However, it is the laboratory work and the extensive modern experimentation as incorporated in the work that substantiate the author's claims and render his book worthy of study.

EPIDEMIC POLIOMYELITIS. Report of the Collective Investigation Committee on the New York Epidemic of 1907. Nervous and Mental Disease Monograph Series. New York. 1910.

This is No. 6 of the monographs published by the *Journal of Nervous and Mental Disease*, and is without doubt the most valuable collection of data on epidemic poliomyelitis that has been gathered together since Wickmann's well-known monograph which appeared in 1906. It is the study of the New York epidemic of 1907, planned and carried out by the New York Neurological Society. The cooperation of Flexner of the Rockefeller Institute was obtained, and he has with Strauss furnished perhaps the most valuable portion of the report on the pathology and pathogenesis of the disease. Most of their work has appeared more or less scattered in other journals. The inclusion of this work in the collective reports gives it additional value. There is scarcely a subject in neurology which at present is of more vital importance than infantile paralysis and this monograph furnishes us with all the facts known at the present time in a clear and readable fashion. The industry and care of the various contributions leave nothing to be desired and the book is a credit to American clinical methods. The publishers are to be congratulated for their enterprise in placing so valuable a monograph in the hands of physicians.

THE ESSENTIALS OF MATERIA MEDICA AND THERAPEUTICS FOR NURSES. By John Foote, M. D., Assistant Professor of Therapeutics and Materia Medica, Georgetown University School of Medicine; Instructor in Materia Medica and Therapeutics, Providence Hospital Training School for Nurses. Philadelphia & London: J. B. Lippincott Co. 1910.

In this manual of therapeutics, the author has eminently succeeded in presenting this subject in a most practical manner. Many facts of lesser importance have been conveniently omitted, and the student is relieved from the burden of selecting the more important subjects from the wealth of pharmacological knowledge. The definitions are short and concise, and, for the most part, may be readily remembered by nurses, for whom the book is written. The action of drugs is well considered, both in the physiological and toxicological sense; the latter being of special importance to the reader. The list of drugs and medicines is quite complete and includes all the remedies, the knowledge of which should prove useful to nurses. Therapeutic indications are presented in a very simple but comprehensive manner, and should be easily understood and remembered.

DIFFERENTIAL-DIAGNOSTISCHE TABELLEN DER INNEREN KRANKHEITEN. Von J. Cemach in Wien. Munich: J. F. Lehmann. 1910. Price, 3 M.

This booklet consists of tables of differential diagnosis of the sort that are found scattered throughout the classical textbooks of internal medicine. It is well worth while to have them brought together, for ready reference, between two covers. The medical student and the young physician will doubtless be the ones to find the book most useful, but it may well be that the older practitioner may occasionally find in it a hint of value in a difficult case.

INDEX.

A			
Subject	Author	Page	
Abscess of liver, cases simulating.....	Dock.....	392	
Acne vulgaris, treatment of.....	Engman.....	943	
Adenoids in infants.....	Chamberlin.....	442	
Adrenal therapy.....	Sajous.....	81	
Age, proper, for retirement from business.....	Editorial.....	636	
Albuminuria, orthostatic.....	Friedlander.....	624	
Alimentary intoxications, anaphylaxis in.....	Housquains.....	889	
Alimentation, duodenal.....	Einhorn.....	758	
American Medical Association at St. Louis, fourth meeting of.....	Editorial.....	363	
Anamnesia syphilitica.....	Fry.....	867	
Anaphylaxis in alimentary intoxications.....	Housquains.....	889	
Anesthesia.....	Leighton.....	956	
Antimeningococcic serum-therapy.....	Housquains.....	548	
Appendicitis, chronic secondary gastric mani- festations in.....	Myer.....	576	
Appendicitis complicating typhoid fever.....	Warfield.....	920	
Appendicitis, prognosis in operations for.....	Savariaud.....	301	
Appendicostomy and cecostomy.....	Clopton.....	614	
Appendicostomy in treatment of intestinal lesions.....	Gant.....	656	
Appendix dyspepsia.....	Myer.....	339	
Arsenic treatment of syphilis and allied disorders.....	Taussig.....	609	
Arthritis deformans.....	Allison.....	54	
Ascites, autoserotherapy of.....	Housquains.....	281	
Auscultation in diagnosis of fractured ribs.....	Lipsitz.....	770	
Autoserotherapy of ascites.....	Housquains.....	281	
B			
Bacterins, vaccines and serums.....	Barnes.....	535	
Basedow's disease.....	Myer.....	687	
Bladder, functional disorders of, simulating cystitis.....	Stein.....	593	
Blood, direct transfusion of.....	Hempelmann.....	316	
Blood pressure affected by medication.....	Engelbach.....	269	
Bone grafting and transference.....	Clopton.....	448	
Bone lesion in tuberculosis and acute osteomye- litis, rachitis and syphilis.....	Horwitz.....	515	
Bone transplantation.....	Allison.....	959	
Books received.....	69, 143, 220, 289, 466, 556, 634, 722, 810, 892,	982	
Book reviews.....	65, 141, 217, 286, 364, 463, 554, 632, 719, 805, 892,	970	
C			
Cancer, critical remarks on advance in.....	Fisch.....	437	
employment of caustic in.....	Ewing.....	426	
gastric, with palpable tumor, operability of.....	Taussig.....	589	
problem.....	Loeb.....	376	
therapy.....	Editorial.....	369	
therapy and fulguration.....	De Keating-Hart.....	418	
treatment of, by radium.....	Wickham.....	731	
Carcinoma of stomach, x-ray diagnosis of.....	Skinner.....	344	
Carlsbad "cure," therapeutic value of.....	Aldor.....	320	
Carnegie foundation report.....	Editorial.....	475	

Subject	Author	Page
Caustic: its employment in cancer and affections of cornea.	Ewing.	426
Cecostomy and appendicostomy.	Clopton.	614
in treatment of intestinal lesions.	Gant.	656
Chair of preventive medicine.	Editorial.	811
Childbirth, early rising after.	Muellerheim.	109
Children, nutritional disturbances in.	Editorial.	904
Cholera in Europe.	705
Cigarette, apotheosis of.	Editorial.	559
City noises: the American Voice.	Editorial.	901
Cleft palate operations, ideal age for.	Blair.	118
Climate, ideal.	Editorial.	4
Conjunctivitis in Bilibid Prison, Manila.	Edwards.	120
Consumptives, duty of community toward.	McConnell.	910
Cornea, employment of caustic in.	Ewing.	426
Cystitis and functional disorders of female bladder.	Stein.	593
Cystocele, operation for.	Gilliam.	683
vagina-fixation of uterus for cure of.	Bandler.	231

D

Daily press and medical news.	Editorial.	639
Diagnosis of epithelioma of larynx.	Delavan.	507
of mitral stenosis.	Patton.	479
of fractured ribs, auscultation in.	Lipsitz.	770
Diagnostic and therapeutic notes.	457, 551, 629, 712, 802, 886,	965
Disinfectants, standardization of.	Gradwohl.	332
Dislocation, habitual or recurrent, of patella.	Horwitz.	49
Dislocations and fractures.	Allison.	274
Ductless glands.	Editorial.	369
Duodenal alimentation.	Einhorn.	758
ulcers.	Myer.	198
Duty of publishing.	Editorial.	472
Dysmenorrhoea of uterine origin.	McNamara.	335
Dyspepsia, appendix.	Myer.	339

E

Ear symptoms in general diseases.	Kyle.	837
Eberthian toxic infection.	Housquains.	709
Ehrlich-Hata remedy (606) in treatment of syphilis.	Wechselmann.	736
Epidermidolysis bullosa, etiology of.	Engman.	499
Epithelioma of larynx, diagnosis and pathological findings in.	Delavan.	507
Ethmoiditis, non-suppurative.	Chamberlin.	880
Etiology of acute poliomyelitis.	Fisch.	126
epidermidolysis bullosa.	Engman.	499
trachoma.	Green, Jr.	278
Extra-uterine pregnancy, probable cause for.	Glasgow.	327

F

Feeding of infants.	Rotch.	305
Ferments.	Editorial.	814
Fracture-dislocations of spine.	Allison.	792
Fractures and dislocations.	Allison.	274
Freudian literature, some new.	Schwab.	697
Frogmarching and forcible feeding.	Editorial.	75
Fulguration and cancer therapy.	De Keating-Hart.	418

G

Subject	Author	Page
Gastric manifestations in chronic appendicitis.....	Myer.	576
Gastro-intestinal syphilis.	Myer.	877
Genito-urinary system, functional disorders of....	Smith.	765
Glycosuria and its relation to pregnancy.....	Ehrenfest.	193
Gonorrheal vulvo-vaginitis, its treatment and prophylaxis.	Butler.	510

H

Hay fever.	Stein.	502
Heart affections, congenital, in relation to malformations.	Friedlander.	130
Hemianopsia.	Green, Jr.	529
Hernia, inguinal, in man.....	Marcy.	414
Historical notes		
Dr. Lawrence Bohune and Dr. John Pott.....		459
Philip Syng Physick.....		716
Royal Academy of Arts, origin of.....		141
How shall we educate our exceptional children?..	Editorial.	809
Hyperesthetic rhinitis.	Stein.	502
Hysteria, current conceptions of.....	White.	11

I

Infants, adenoids in.	Chamberlin.	442
successful feeding of.....	Rotch.	305
vaccination of.	Snyder.	410
Inguinal hernia in man.....	Marcy.	414
Internationalism in medical education.....	Editorial.	367
Intestinal motility, fluoroscopic investigations of medication affecting.....	Engelbach.	522
Intussusception, treatment for.....	Zahorsky.	105

L

Laboratories, medical society.....	Editorial.	561
Literary notes.....	8, 78, 153, 300, 478, 564, 641, 728, 816,	908
Liver, cases simulating abscess of.....	Dock.	392
Local care and treatment of tuberculosis.....	Flick.	938

M

Magic belts in the cure of the sick.....		627
Malformations in relation to congenital heart affections.	Friedlander.	130
McDowell, Ephraim.	Gellhorn.	600
Medical colleges.	Editorial.	633
orchestras.	Editorial.	291
profession in relation to preventive medicine..	Flick.	371
research work.	Editorial.	365
school and university.....	Editorial.	298
terms, evolution of.....	Editorial.	816
Medicine as a preparation for other careers.....	Editorial.	1
Metchnikoff and the ever-recurrent question.....	Editorial.	899
and the Pasteur Institute.....	Housquains.	454
Military medical carrier, advantages and disadvantages of.	Editorial.	293
Mitral stenosis, diagnosis of.....	Patton.	479
Myocarditis, chronic, etiology and diagnosis of... Babcock.		395
treatment of.	Elliot.	402

N		
Subject	Author	Page
Nephritis and allied disorders.....	Taussig.....	432
Nephrolithotomy and pyelolithotomy.....	Caulk.....	788
Nervous diseases, factors shaping the treatment of.....	Collins.....	668
system, pathology of syphilis of.....	Schwab.....	201
Nightingale, Florence.....	Editorial.....	727
Nipple, Paget's disease of.....	Jonas.....	674
No. 606, a new rubric.....	Editorial.....	557
Nurses, higher education for.....	Editorial.....	562
Nutritional disturbances in children.....	Editorial.....	904

O		
Operations for appendicitis, prognosis in.....	Savariaud.....	301
cleft palate.....	Blair.....	118
cystocele.....	Gilliam.....	683
Ophthalmic cases, two rare.....	Ball.....	47
Ophthalmology, tuberculin therapy in.....	Green, Jr.....	883
Opinion and criticism.....	151, 225, 367, 478, 561, 639, 727, 814, 904	
Opium habit in Persia.....		452
Optimism, an engaging chapter in.....	Editorial.....	149
Orchitic and ovarian therapy.....	Schmauch.....	92
Orthostatic albuminuria.....	Friedlander.....	624
Osteomyelitis, tuberculous and acute, bone lesions in.....	Horwitz.....	515
Otology, vaccine therapy in.....	Chamberlin.....	57
Otosclerosis, causation of.....	Yearsley.....	251
Ovarian and orchitic therapy.....	Schmauch.....	92
Oxaluria and renal calculus, case of.....	Baumgarten.....	262

P		
Paget's disease of nipple.....	Jonas.....	674
Parotid gland, tumors of.....	Reder.....	42
Pasteur institute and Elie Metchnikoff.....	Housquains.....	454
Patella, habitual or recurrent dislocation of.....	Horwitz.....	49
Pathology of syphilis of nervous system.....	Schwab.....	201
uncinariasis.....	Evans.....	167
Pellagra, clinical features of.....	Zeller.....	745
early symptoms of.....	Bass.....	175
Physician in the Roman Army.....		284
Pituitary gland, surgery of.....	Clopton.....	122
Poliomyelitis, acute anterior.....	Friedlander.....	871
etiology of.....	Fisch.....	126
anterior.....	Allison.....	445
Post-graduate study.....	Editorial.....	906
Pregnancy, extra-uterine, probable cause for.....	Glasgow.....	327
and glycosuria.....	Ehrenfest.....	193
in its relation to disease.....	Ehrenfest.....	239
Pre-Hippocratic medicine.....	Comrie.....	842
Preventable disease, society's responsibility for.....	Editorial.....	223
Preventive medicine.....	Editorial.....	77
and the medical profession.....	Flick.....	371
Prognosis in operations for appendicitis.....	Savariaud.....	301
Psycho-analysis, theory, methods and psychotherapeutic value of.....	White.....	643
Psychology and Hamlet.....	Editorial.....	221
Psychoneuroses, modern conception of.....	Jones.....	567

INDEX

979

Subject	Author	Page
Pulmonary roentgenology.	Skinner.	701
Pyelolithotomy and nephrolithotomy.	Caulk.	788

Q

Quéry's serum for syphilis.		800
-------------------------------------	--	-----

R

Rachitis, bone lesion in.	Horwitz.	515
Radium in its modern application.	Engman.	796
therapy.		63
treatment of cancer by.	Wickham.	731
Renal calculus and oxaluria, case of.	Baumgarten.	262
Ribs, fractured, auscultation in diagnosis of.	Lipsitz.	770
Roentgenology, pulmonary.	Skinner.	701
Roentgen pyelography and ureterography.	Skinner.	532
Rousseau's mental state.		545

S

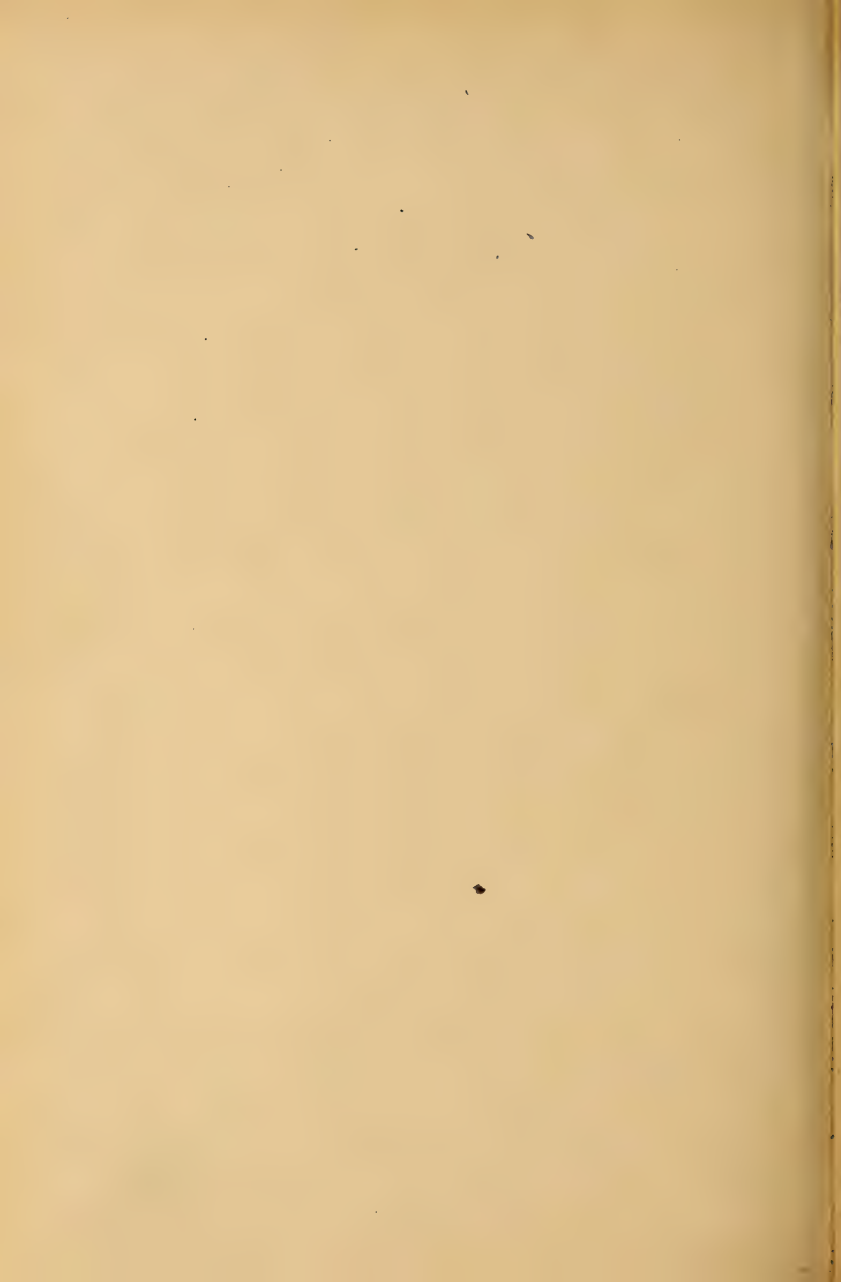
St. Louis medicine, renaissance of.	Editorial.	359
meeting of the American Medical Association.	Editorial.	469
Scarlet fever.	Friedlander.	341
Science, gifts to.	Editorial.	561
Scorpion, poisonous, a preliminary study of.	Jackson.	485
Serums, vaccines and bacterins.	Barnes.	535
Skin sterilization, new methods of.	Taussig.	951
Spengler's "I. K." in treatment of tuberculosis.	Benker.	932
Spine, fracture-dislocations of.	Allison.	792
Spondylitis typhosa.	Frick.	819
Staining methods of tubercle bacilli.	Fisch.	619
Sterilization of skin.	Taussig.	951
of the unfit.	Editorial.	721
Stomach, physiology of.	Shattinger.	857
x-ray diagnosis of carcinoma of.	Skinner.	344
Succession and taxis.	Zahorsky.	105
Surgery of pituitary gland.	Clopton.	122
simple.		212
Syphilis, arsenic treatment of.	Taussig.	609
bone lesion in.	Horwitz.	515
chemical cures for.	Editorial.	640
Dr. Quéry's serum for.		800
Ehrlich's new specific for.	Engelbach.	773
gastro-intestinal.	Myer.	877
Ehrlich-Hata remedy in treatment of.	Wechselmann.	736
of nervous system, pathology of.	Schwab.	201

T

Taxis and succession.	Zahorsky.	105
Tenements, overcrowded.	Editorial.	7
Tests for renal function.	Caulk.	961
Tetany, some observations on.	Cross.	179
Therapeutics, credulity and scepticism in.		968
Tissue cultivation.	Editorial.	905
Trachoma, etiology of.	Green, Jr.	278
Treatment, arsenic, of syphilis and allied dis-		
orders.	Taussig.	609
for intussusception.	Zahorsky.	105
of acne vulgaris with acne bacillus suspen-		
sions.	Engman.	943

Subject	Author	Page
Treatment of cancer by radium.....	Wickham.	731
chronic myocarditis.	Elliott.	402
gonorrheal vulvo-vaginitis.	Butler.	510
intestinal lesions.	Gant.	656
nervous diseases.	Collins.	668
pulmonary tuberculosis, Carl Spengler's "I. K." in.....	Benker.	932
pulmonary tuberculosis with tuberculin.	Pel.	185
retrodisplacement of uterus.....	Crossen.	24
syphilis, Ehrlich-Hata remedy in.....	Wechselmann.	736
tyhoid fever.	Wilcox.	584
venereal diseases, uniform interstate rules in.....	Ravogli.	156
Trypanosomiasis in Belgian Congo.....	Hollebeke.	926
Tubercle bacilli, staining methods of.....	Fisch.	619
Tuberculin in treatment of pulmonary tuber- culosis.	Pel.	185
therapy in ophthalmology.....	Green, Jr.	883
Tuberculosis, advantages of local treatment of.....	Flick.	938
Carl Spengler's "I. K." in treatment of.....	Benker.	932
tuberculin in treatment of.....	Pel.	185
some relevant words on.....		347
Tumors of parotid gland.....	Reder.	42
Typhoid fever and appendicitis.....	Warfield.	920
Typhoid fever, experimental.....		641
treatment of.	Wilcox.	584
prevention, problem of.....	Editorial.	724
U		
Ulcers, duodenal.	Myer.	198
Uncinariasis.	Taussig.	206
.....	Weston.	257
pathology of.....	Evans.	167
symptoms of.....	Dock.	163
Urotropin as an internal antiseptic.....	Engelbach.	60
Uterus, office treatment of retrodisplacement of.....	Crossen.	24
vagino-fixation of, cure of cystocele.....	Bandler.	231
V		
Vaccination, antituberculous, problem of.....	Housquains.	351
of infants.	Snyder.	410
Vaccine therapy.	Editorial.	368
in otology.	Chamberlin.	57
Vaccines, bacterins and serums.....	Barnes.	535
Venereal diseases, uniform interstate rules in treatment of.	Ravogli.	155
W		
"Wait till you come to forty year".....		134
Wassermann reaction and its relation to work of obstetrician and gynecologist.....		690
When doctors engage in literary pursuits.....	Editorial.	145
Who are the enemies of the medical profession?..	Editorial.	147
X		
X-ray diagnosis of carcinoma of the stomach.....	Skinner.	344
ink.	Skinner.	935







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